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A Grammar of the Jewish Arabic Dialect of Gabes

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2. PHONOLOGY

1.0. Introduction[1]

This chapter presents a phonological analysis of the Arabic dialect of the Jews of Gabes, combined with a comparative examination of various phonological phenomena in the Muslim variety of Gabes and in selected Arabic dialects of the region. The primary aim of the study is to establish the features that distinguish Jewish Gabes from other Jewish North African dialects, and, since no south Tunisian Jewish dialect has been studied to date, to produce a thorough analysis of the sound system of this variety.[2] Special attention is paid to the distribution of sibilants in the region, which is tentatively explained by a substrate theory. Moreover, this survey constitutes the first attempt at acoustic analysis of the emphatics and vowels in North African Arabic. Based on data obtained by means of the software Praat, it has been shown that the emphatic consonants in Jewish Gabes have different levels of spreadability.

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[1] This chapter is a revised and updated version of my paper titled 'The Phonology of the Judaeo-Arabic Dialect of Gabes' (2023a). Several changes have been implemented in comparison to the original article, primarily due to improved data accessibility after the pandemic. This facilitated additional verifications and validations, which were impossible during lockdown.

[2] Some remarks on the phonology and morphology of the Jewish dialect of Djerba have been mentioned in Behnstedt (1998).

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Apart from the works of Saada (1964) and Behnstedt (1998) on Jewish Djerba, no systematic phonological description of any Jewish dialect of southern Tunisia has been undertaken so far. Moreover, no acoustic analyses of any Maghrebi dialects are known to me. It is therefore not surprising that, for instance, the phenomenon of emphasis spread, which has received much treatment in the eastern branch of Arabic (Watson 1999 for Yemeni; Omani and Jaber 2019 for Jordanian; Altairi et al. 2017 for Egyptian, Palestinian, Saudi, and Yemeni), in North Africa is almost entirely unexplored.[3] Against this background, this chapter has two principal aims. Firstly, it investigates the peculiarities of the Jewish Gabes phonological system in contrast with neighbouring dialects, and it attempts to cast light on the distribution of the sibilants within the region. Secondly, by providing an acoustic analysis of emphatics and vowels, it endeavours to fill the aforementioned lacuna in the study of the phonology of North African Arabic.

2.0. Overview of the Consonants

As Table 3 below shows, the consonantal system of Jewish Gabes is considerably different from that of Classical Arabic (henceforth: CA), and of Muslim dialects of the region. The set of consonants has undergone both reduction and enrichment compared to CA and, as a result, although some groups of sounds have disappeared, new sounds have emerged as well. This phenomenon

[3] The only study known to me on emphasis in North African Arabic is that of Marçais (1948).

is observed in many Maghrebi dialects (Cohen 1912, 19). Similarly to other Jewish dialects of the North African group, the interdentals are completely non-existent in Jewish Gabes. On the other hand, a series of new emphatic consonants have emerged: [m̩], [n̩], [l̩],[4] /b̩/ and /r̩/. However, compared to some neighbouring dialects, Jewish Gabes does retain some CA sounds. For instance, in Jewish Algiers, /q/ is pronounced as a glottal stop (Cohen 1912, 29), while /h/, similarly to in Jewish Tripoli (Yoda 2005, 75) and Jewish Tunis (Cohen 1975, 35), has almost completely disappeared. Contrary to this, in Jewish Gabes both of these sounds are stable, although, as will be argued, the realisation of /q/ is not uniform. In the following section (§3.0), I describe selected consonants that are characteristic of Jewish Gabes, or whose realisation differs from CA and the neighbouring dialects.

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[4] In the transcription, phonemes are placed between two slashes, whereas allophones and consonants that do not possess phonemic status are marked by square brackets.

Table 3: Consonantal inventory

	Labial	Dental / Alveolar	Palato-alveolar	Velar	Uvular	Pharyngeal	Laryngeal
Stop							
Unvoiced	[p]	t		k	q		
Voiced	b	d		g			
Emphatic	ḅ	ḍ ṭ					
Affricate							
Unvoiced							
Voiced							
Fricative							
Unvoiced	f	[s]	š	x		ḥ	h
Voiced		[z]	ž	ġ		ʕ	
Emphatic	[ḟ]	ṣ ẓ					
Nasal							
Plain	m	n					
Emphatic	[ṃ]	[ṇ]					
Lateral							
Plain		l					
Emphatic		[ḷ]					
Rhotic							
Trill			r				
Emphatic			ṛ				
Approximant	w	y					

3.0. Remarks on Realisation of Consonants

3.1. Bilabials

3.1.1. /b/–/ḅ/

CA ب is preserved as a plosive bilabial voiced consonant. Its realisation can change depending on its position in a word. When /b/ is at the beginning of a word and is followed by an unvoiced consonant, it turns into a devoiced allophone [p], e.g., *bḥaṛ* [pḥaṛ] ‘sea’. When, however, the same sequence is preceded by a vowel, /b/ has its regular plosive realisation, e.g., *yəbkīw* ‘they cry’. On the other hand, in word-final position, especially in monosyllabic words containing a short vowel, /b/ tends to be geminated, e.g., *rkəb*[*b*] ‘he rode’. In these cases, the air stream pressing on the mouth very often gives an impression that /b/ is emphatic, since emphasis consists of pharyngealisation and labialisation.[5]

/b/ has an emphatic counterpart /ḅ/, which occurs either as an independent phoneme or as a result of emphasis spread in the vicinity of an emphatic consonant. Its phonemic status, contrary to Muslim Gabes, is not certain (Skik 1969, 85). The following minimal pair potentially proves the phonemic character of

[5] Gemination of a consonant at the end of a word is also attested in Jewish Algiers; see Cohen (1912, 66).

/ḅ/: *bāba* ‘her door’ : *ḅāḅa* ‘father’.[6] The minimal pair that proves the phonemic status of /ḅ/ in Jewish Tripoli, i.e., *rəbbi* ‘rabbi’ : *ṛəḅḅi* ‘God’, is not valid in Jewish Gabes, as the two words differ both in terms of emphaticity and vowel quality, i.e., *rəbbi* ‘rabbi’ : *ṛaḅḅi* ‘God’.[7] However, in words like *yəṭḷaḅ* ‘he asks’, /ḅ/ results from rightward extension of the emphasis rooted in originally emphatic /ṭ/. In most cases /ḅ/ has a clearly plosive character, and in certain words it is followed by reduced, short epenthetic /u/ and hence has a labial vocalic release, e.g., *ḍṛəḅᵘha* ‘he hit her’, *ʕaṛḅᵘi* ‘Arabic’. A similar phenomenon is attested in Jewish Algiers (Cohen 1912, 57).[8] One of the possible explanations for this “semi-vocalic complement,” as Cohen refers to it, is related

[6] The 3FS pronominal suffix in *bāba* ‘her door’ is unstable. I have recorded utterances where the etymological /h/ is clearly audible, but it is lost in the stream of fast speech. The minimal pair in question should therefore be taken with a pinch of salt, as it involves an allophonic realisation.

[7] It is important to notice, however, that the quality of /r/ in *rəbbi* ‘rabbi’ is unstable and the consonant occasionally tends to be emphaticised. The second formant of the segment /ra/ pronounced by the same male informant had on one occasion a value of 1938 Hz, i.e., it clearly was not emphatic, but on another occasion dropped to 1681 Hz, i.e., closer to the emphatic region. Indeed, in fast speech, these two words are more easily distinguished by the vowel quality.

[8] Paradoxically, this phenomenon is not attested in Jewish Tunis, in which /b/ is explicitly plosive (Cohen 1975, 15) and, contrary to some other Maghrebi dialects, does not bear any traces of spirantisation.

to the realisation of the emphatic consonants, which usually involves some level of lip-rounding, i.e., retraction of the dorsum simultaneously brings about a slight rounding of the lips.

Similarly to /b/, /ḅ/ undergoes the same process of devoicing when followed by a voiceless plosive or fricative and shifts to emphatic /ṗ/, e.g. *ṗṭən* [ḅṭəṇ] 'belly'. From an etymological point of view, the /ḅ/ phoneme occurs in many loans from other languages and essentially corresponds to /p/, /b/, and /v/, e.g., *ḅlāṣa* 'place, building' (Ital. *palazzo*), *ḅīḅāṣ* 'Christian priest' (Gr. *papas* > Turk. *papaz*), *ḅrīma* 'well' (Ital. *prima*), *ḅāḅūr* 'boat' (Ital. *vapore*).[9]

3.1.2. /m/–[ṃ]

/m/ occurs in two realisations, i.e., a plain nasal bilabial, and an emphatic one, which in Jewish Gabes is not a phoneme. The emphaticisation of /m/ is similar to that of /b/. Similarly to Jewish Tripoli, when [ṃ] is followed by /əy/ or /i/, it becomes labialised, e.g., *əṃṃ^{w}i* 'my mother' (Yoda 2005, 27). In addition, in some words, the initial /m/, which should normally be followed by /w/, shifts to geminated [ṃ], whereby /w/ is fully assimilated. This phenomenon, ubiquitous in Jewish Tunis, is in Gabes only partially operational, and one can therefore find forms with /w/ retained alongside those with geminated [ṃ], e.g., *mwākəl–ṃṃākəl* 'food' (Cohen 1975, 18).

[9] In Jewish Tripoli, Italian /v/ and /p/ shifted into /ḅ/, i.e., *ḅaḅuṛ* (Yoda 2005, 318), while in Jewish Algiers they shifted into /p/, i.e., *papōr* (Cohen 1912, 58).

3.2. Labiodentals

3.2.1. /f/–[f̣]

ف in Jewish Gabes is realised as a labiodental voiceless fricative /f/. It has its emphatic counterpart *f̣*, which often stems from emphasis spread, e.g., *tf̣əṛ* 'nail'. In addition, as in the case of geminated [ṃ], emphatic [f̣] emerges due to a shift from /fw/ to geminated /f̣/, e.g. *f̣f̣ām* < **fwām* 'mouths'. Interestingly, this shift is also attested in the Bedouin dialect of the region of Douz (Ritt-Benmimoun 2014, 51). As far as I could establish, [f̣] is not phonemic in Jewish Gabes.

3.3. Dentals

3.3.1. /t/

The /t/ sound in Jewish Gabes represents two CA consonants, namely, ت and ث. The post-dental realisation of the latter CA interdental fricative ث can be found in words like: *tlāta* 'three', *təlž* 'snow', or *tūm* 'garlic'. Contrary to this, Muslim dialects do distinguish between them; both Muslim Gabes (Skik 1969, 86), Tunis (Cohen 1975, 19), and Muslim Algiers (Cohen 1912, 21) have preserved the interdental /ṯ/. In addition, in Jewish Gabes, /t/ is also the result of the devoicing of /d/, e.g., *tqīqa* 'minute' (< *daqīqa*).[10] Similarly, /t/ reflects, in some cases, a historical

[10] In the present chapter, the '<' sign represents correspondence to an item in CA and does not signify direct descendance of the dialectal forms from CA.

CA /d̲/ that has undergone devoicing, e.g., *d̲akar* > *tkər* ‘masculine’.

The loss of interdental consonants in North Africa is considered to be a feature of some Jewish urban dialects, while in the second-layer dialects, both rural and Muslim urban, they are generally preserved.[11] In the Jewish dialects, being mostly of the urban, pre-Hilālī type, one observes a strong tendency towards the plosive realisation of /t̲/ and /d̲/. To the best of my knowledge, among the Jewish varieties of the central Maghreb, only speakers from Wad-Souf (El-Oued) preserve the interdentals (Gębski, forthcoming a).

3.3.2. /ṭ/

The emphatic counterpart of /t/, as in CA, is an independent phoneme. This can be proved by minimal pairs: *ṭāb* ‘he cured’ : *tāb* ‘he admitted, he pleaded guilty’, *šəṭṭ* ‘coast’ : *šədd* ‘he seized’, *ṭāṛ* ‘he flew’ : *ḍāṛ* ‘house’. The origin of this consonant in Jewish Gabes is more complex. It reflects CA ط e.g., *ḥaṭṭ* (< CA *ḥaṭṭa*) ‘he put’, as well as ظ in words like *tfəṛ* (< CA *ḍufur*) ‘nail’. In addition, in some numerals, due to emphasis spread, /t/ shifts to /ṭ/, e.g., *ṭləṭṭāš* (< CA *ṯalāṯat ʕašar*) ‘thirteen’.

3.3.3. /d/

In Jewish Gabes, both CA dental د and interdental ذ have the reflex of the same consonant /d/, e.g., *rədd* (< CA *radda*) ‘he replied’, *dhəbb* (< CA *d̲ahab*) ‘gold’. It tends to be geminated at

[11] It has recently been suggested that the preservation of interdentals might be a trait of some pre-Hilālī dialects (Guerrero, 2021).

the end of the word by strong pressure of the tongue on the front teeth, e.g., *ḥadd* ‘someone’. In some words, however, it reflects an original /t/ consonant that has undergone voicing, especially when followed by a voiced consonant, e.g., **tžī* > *džī* ‘you come’.

3.3.4. /ḍ/

The occurrence of /ḍ/ follows a similar pattern to that of /ṭ/. Its phonemic status can be demonstrated on the basis of minimal pairs such as *ḍāq* ‘he became narrow’ : *dāq* ‘he tasted’. The Jewish Gabes /ḍ/ represents several CA consonants, as well as some foreign sounds. First of all, it reflects the following Arabic consonants: emphatic ض as in *ḍṛəb* ‘he hit’ (< CA *ḍaraba*), interdental emphatic ظ as in *ṇəḍḍəf* ‘he cleaned’ (< CA *naḍafa*), plosive /d/ as in *ẓḍəṃ* ‘he attacked’ (< CA *ṣadama*), and emphatic /ṭ/ as in *ẓḍaḍ* ‘he hunted’ (< CA *ʔiṣṭāda*). In addition, emphatic /ḍ/ represents some foreign elements, e.g., *ṣəḍḍūṛ* ‘prayer book’ from Hebrew סידור.

3.3.5. /n/–[ṇ]

The Classical ن is represented by a nasal consonant, which in the vicinity of the emphatics becomes emphaticised, e.g., *ṇəẓḍəm* ‘I attack’. In Jewish Gabes, similarly to Jewish Tunis, emphatic [ṇ] is very frequent (Cohen 1975, 20). Remarkably, while the prefix of the first person is fairly regularly emphaticised, it is almost never emphaticised in the suffix of the first person plural, e.g., *ṇəṭḷəḅ* ‘I/we ask’, but *ṭḷəḅna* ‘we asked’. In turn, when /n/ is followed by a velar consonant, its pronunciation shifts to a velar nasal, e.g., *zəŋqa* ‘blind alley’.

3.4. Alveolars and Postalveolars

3.4.1. [s]–/ṣ/

Due to the processes of emphasis spread and palatalisation, the occurrence of the /s/ consonant in Jewish Gabes is considerably limited. Yoda (2006) claims that Jewish Gabes has lost its /s/ and /z/ altogether, arguing that, in items containing emphatic consonants, CA /s/ shifts regularly to /ṣ/. My data, however, suggest that the situation of /s/ in Jewish Gabes is more complex. Indeed, in many cases, CA /s/ has shifted in Jewish Gabes to /ṣ/ due to assimilation in emphaticity, e.g., *ṣəlṭān* 'sultan' (< CA *sulṭān*), *rāṣ* 'head' (<CA *raʔs*). Nevertheless, the emphatic property of /ṣ/ is often dropped and a plain /s/ emerges, even in words with etymological /ṣ/. An acoustic study of the second formant (F2) of selected occurrences of /ṣ/ reveals that its emphatic realisation is unstable, e.g., the F2 of segment /ṣə/ in *yāṣər* 'a lot' has in one speaker a value of 1745.57 Hz, and in another a value of 2036.18 Hz. Both of these speakers are female and of similar age. Meanwhile, loss of emphasis takes place also in items with etymological /ṣ/. For example, in *bṣəl* 'onion', the frequency of the segment /ṣə/ is 2984.77 Hz, while that of /ṣa/ in *ṣānʕa* 'servant' is 2630.96 Hz. Against this background, /ṣ/ in *ṣābūn* 'soap' has a middle-height frequency of 1993.16 Hz, while the same consonant in *ma rqāwāṣ* 'they did not find her' is as low as 1363.15 Hz. Such a wide span of F2 suggests that, in certain lexical items, speakers tend to de-emphasise /ṣ/, presumably due to language contact with Modern Hebrew, which does not possess emphatic consonants. This, in turn, seems to indicate that /s/ as a sound

does exist in Jewish Gabes, although its phonemic status remains ambiguous.

3.4.2. /š/

In Jewish Gabes, in lexical items not containing emphatic consonants, CA /s/ has shifted to /š/, e.g., /š/, e.g., *šīd* 'master' (< CA *sayyid*), *xmīš* 'fifth' (<CA *xāmis*). The realisation of postalveolar /š/ in Jewish Gabes depends on the age of the speaker. Those of the older generations tend to pronounce this consonant as a palatal, younger speakers as a postalveolar. In his study of Jewish Algiers, Marcel Cohen (1912, 24) also points out that a great number of speakers of that dialect tend to realise /š/ in the frontal part of the palate, creating an impression of an affricated articulation, i.e., [ɕ] in IPA. He calls this realisation 'lisping' (Fr. *zézaiement*) and notes that it is one of the distinctive features of Maghrebi Jewish dialects in general.

In Table 4 below one can find minimal pairs involving /s/, /ṣ/, and /š/ in five dialects of the region. As can be seen, Jewish Gabes and Jewish Tunis are the only dialects with no minimal pair involving s : š. This, in turn, points to an extensive weakening of this phoneme caused by a gradual shift from a plain realisation to palatalised and emphasised ones. On the other hand, the Muslim dialect of Gabes distinguishes phonemically between /s/ and /š/ (Skik 1969, 88).

Table 4: Minimal pairs involving sibilants in selected dialects of North Africa

Dialect	s : š	ṣ : š	s : ṣ
Jewish Gabes	-	*ṣīf* 'summer' : *šīf* 'sword'	-
Muslim Gabes[12]	*sadd* 'he moved' : *šadd* 'he grasped'		*sūm* 'price proposal' : *ṣūm* 'fast!'
Muslim Tunis[13]	*sœbb* 'he insulted' : *šœbb* 'alum'	-	*sbōʕ* 'week' : *ṣbōʕ* 'finger'
Jewish Tripoli	*nsa* 'women' : *nša* 'starch'	*ṣuṛ* 'wall' : *šuṛ* 'months'	*sif* 'sword' : *ṣif* 'summer'
Jewish Tunis	-	*ṣif* 'summer' : *šif* 'sword'	-
Jewish Algiers	-	-	*sif* 'sword' : *ṣif* 'summer'

3.4.3. [z]–/ẓ/–/ž/

CA /z/ is retained only in a limited number of items, where it is followed by a non-emphatic /r/, e.g., *əzri* 'run!'. According to Yoda (2006, 15), the plain /z/, like the plain /s/, does not exist in Jewish Gabes. However, as is the case with /s/, analysis of F2 demonstrates that the high value of the second formant in some items containing /ẓ/ does not permit us simply to classify it as emphatic. For instance, the frequency of the segment /əz/ in *əzri* 'run!' is 2002.95 Hz, as opposed to the 1302.35 Hz of /ẓə/ in

[12] Sources: Muslim Gabes—Skik (1969, 89); Muslim Tunis—Singer (1984, 51); Jewish Tripoli—Yoda (2005, 18), Jewish Tunis—Cohen (1975, 25), Jewish Algiers—Cohen (1912, 122, 206).

[13] The items are quoted according to their original transcription in the grammar book they were borrowed from.

ṛāẓəl ‘man’, or the 1228.67 Hz of /əz/ in *əẓṛāṛa* ‘rope’. We should assume, therefore, that the rule known from Jewish Tunis, by which the plain /z/ is retained before a non-emphatic /r/, is to some extent also valid in Jewish Gabes.

Emphatic [ẓ] in Jewish Gabes does not have any direct ancestor in CA and reflects either original /z/ which was emphaticised in the vicinity of emphatics, e.g., *ẓḷaq* ‘he slipped’ (<CA *zaliqa*), *əẓṛaq* ‘blue’ (<CA *ʔazraq*); or original /j/, which had shifted to /z/ and was subsequently emphaticised due to its proximity to emphatics, e.g., *jār* > **zāṛ* > *ẓāṛ* ‘neighbour’. In addition, it reflects CA /ṣ/, as in *ẓġīr* ‘small’ (< CA *ṣaġīr*).

/ž/ in Jewish Gabes is a retroflex fricative sibilant and, like /š/, is palatalised amongst older speakers to [ʑ]. Essentially, it reflects two CA consonants: /j/, e.g., *ʕažūža* ‘elderly woman’ (< CA *ʕajūza*), *žbəl* ‘mountain’ (< CA *jabal*); or /z/, e.g., *žūž* ‘pair’ (< CA *zawj*), *žītūn* ‘olives’ (< CA *zaytūn*).

In lexical items containing an alveolar and an alveopalatal sibilant, we observe an assimilation of the former by which sibilant harmony is formed, e.g., CA *šams* > *šəmš*.[14] In addition, it is worth mentioning that Jewish Gabes exhibits a certain level of exchangeability of emphatics and palatalised sibilants in items containing only one sibilant, e.g., *ṛāžəl* has been attested alongside *ṛāẓəl* ‘man’, and similarly *šxən* alongside *ṣxən* ‘he warmed himself’. This development is presumably rooted in the linguistic landscape of North Africa before the first wave of Islamisation of the region (Gębski, 2023b).

[14] The phenomenon of sibilant harmony in North African Arabic is discussed in greater detail in Gębski (2023b).

3.5. Laterals

3.5.1. /l/–[l̩]

This is a lateral liquid, which undergoes emphaticisation in the vicinity of an emphatic consonant, e.g., *ṣl̩a* 'synagogue'. The emphatic realisation occurs also in some words of foreign origin, e.g., *ḅl̩āṣa* 'place, building' (Ital. *palazzo*), *l̩āḅəṣ* 'pencil' (Ital. *lapis*). As far as I have observed, [l̩] in Jewish Gabes is not an independent phoneme.[15]

3.6. Trills

3.6.1. /r/–/ṛ/

There are two types of non-emphatic /r/ that can be distinguished in Jewish Gabes. The first, which occurs more frequently, is an alveolar trill produced by an intensive vibration of the tip of the tongue above the alveolar ridge. When /r/ is preceded by a vowel, the vibration tends to be considerably reduced. The second variant is a uvular fricative [ʁ] which, according to Cohen (1975, 26), occurred in Jewish Tunis due to the influence of French and is audible mostly among younger speakers. In Jewish Gabes, the fricative realisation seems to be conditioned by the phonetic environment, i.e., when an emphatic /ṛ/ is preceded by a vowel, it tends to shift to a uvular fricative. It is worth noting,

[15] It seems that /l̩/ in Jewish Tripoli is an independent phoneme given the following minimal pair: *wəlla* 'or' : *wəl̩l̩a* 'by God' (Yoda 2005, 20). Similarly in Muslim Gabes, *xalli* 'lead' : *xal̩l̩i* 'my vinegar' (Skik 1969, 90).

however, that this is not a fixed rule and, in certain cases, even when preceded by a vowel, /ṛ/ is realised as a trill.[16] In Jewish Tripoli and Jewish Benghazi, on the other hand, /r/ is a back continuant regardless of the phonetic environment, e.g., *ʕarūsa* [ʕaʁōsa] 'fiancé', *rāḥ* [ʁāh], 'he went', *kbīra* [kbīʁa] 'big (FS)'. The same realisation is found in words of Hebrew origin, e.g., *paraša* [paʁaša] 'weekly Torah portion'.[17]

As has already been mentioned, /r/ has its emphatic counterpart /ṛ/. In contradistinction to Muslim Gabes and other dialects of the region, where this consonant is phonemic, in Jewish Gabes its phonemic status is unclear (Skik 1969, 90).[18] Two minimal pairs have been found where the emphatic feature of /ṛ/ seems to be phonemic, i.e., *kra* 'he rented' : *kṛa* 'he hated',[19] *zra* 'he ran' : *ẓṛa* 'it happened'. The F2 of the /ra/ segment in the latter pair is respectively 1610 Hz and 1310 Hz. This clearly indicates that /r/ has different levels of emphaticity in these words.

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[16] One cannot exclude the possibility that this realisation emerged due to the influence of Israeli Hebrew, in which /r/ is pronounced by younger generations as a velar or uvular fricative.

[17] This has been established based on recordings of native speakers of Jewish Tripoli and Jewish Benghazi uploaded on the website of the Mother Tongue project: https://www.lashon.org/1/taxonomy/term/132, accessed 15 November 2023.

[18] The phonemic status of /ṛ/ is attested in both Jewish and Muslim Tunis (Cohen 1975, 27; Singer 1984, 47), Jewish Algiers (Cohen 1912, 53), and Jewish Tripoli (Yoda 2005, 59).

[19] This minimal pair is somewhat dubious, as I recorded also *kṛah* 'he hated', where /h/ is preserved in a slow speech. The allophonic realisation *kṛa* has been attested in a fast stream of speech.

Although in many cases, /ṛ/ has developed through emphasis spread from a nearby emphatic consonant, e.g., *ṃṛīḍ* ‘sick’ (< CA *marīḍ*), in numerous words, /ṛ/ is the only emphatic, e.g., *maṛṛa* ‘time’. At times, the /i/ vowel has prevented the emphaticisation of /r/ to /ṛ/, e.g., *fāṛ* ‘mouse’–*fīrān* ‘mice’, *ẓāṛ* ‘neighbour’–*žīrān* ‘neighbours’.[20] The same phenomenon is attested in the Bedouin dialect of Douz (Ritt-Benmimoun 2014, 15). In addition, one can observe that /ṛ/ does not occur in certain consonantal environments, namely, when it occurs after or before the following consonants:

- velar plosive /k/ and /g/, e.g., *drək* ‘he was in a hurry’, *rkəb* ‘he rode’, *škər* ‘he got drunk’;
- uvular fricative /x/ and /ġ/, e.g., *xrəž* ‘he went out’, *waxxər* ‘he was late’, *rġab* ‘he begged’, *ġarbān* ‘strainer’;
- pharyngeal /ḥ/, e.g., *rḥātu* ‘she grinded him’, *rtāḥ* ‘he rested’, *xrəb* ‘he ruined’;
- palato-alveolar sibilants /ž/ and /š/, e.g., *kərši* ‘chair’, *frəš* ‘bed’, *rža*ʕ ‘he returned’.

It is worth noting, however, that in many words where the occurrence of /ṛ/ is conditioned by emphasis spread, its emphatic character is not stable and, in some cases, /r/ is audible instead of the expected /ṛ/. This phenomenon has already been identified in Jewish Tunis, where the distribution of /ṛ/ is very often related to a social group or neighbourhood. Cohen (1975, 29) remarks

[20] A more comprehensive analysis of this phenomenon can be found in §3.13.

that, in the Ḥāṛa of Tunis, most speakers tend to pronounce /r/ as emphatic, whereas elsewhere it is pronounced plain.

3.7. Uvulars

3.7.1. /q/

Even though /q/ has been classified here as a uvular consonant, its realisation is very often more frontal, as palato-velar /k/. This is also attested in Jewish Tunis (Cohen 1975, 31), whereas in Jewish Algiers, CA ق has weakened to the extent that it is realised as /ʔ/ (Cohen 1912, 43).[21] Fronting of /q/ to /k/ is one of the characteristic traits of sedentary Jewish dialects in North Africa (Aguadé 2018, 45).[22]

3.7.2. /ġ/

In Jewish Gabes, the realisation of /ġ/ is as a uvular fricative, and no cases of trill realisation are attested. In Jewish Tripoli both realisations exist, and Yoda (2005, 11) reports that /ġ/ has the same phonetic value as /ṛ/.

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[21] Cohen (1912, 44) points out that the realisation of /q/ is unstable among Jewish speakers and men tend to pronounce it as a uvular, while women prefer the weakened realisation /ʔ/. This can be explained by the fact that women were less exposed to contact with Muslim speakers, who pronounce /q/ as a uvular.

[22] It is worth noting that, in some Arabic dialects of the eastern branch, a further fronting takes place, which also involves palatalisation, i.e., /k/ > /č/, e.g., *samak* > *samač* in Muslim Baghdadi (based on my own recordings).

The phonemes /q/ and /ġ/ display in some words a certain degree of labialisation. A parallel phenomenon is attested in Berber, where velars and uvulars are labialised due to the historical process of the loss of short /u/, which subsequently brought about a rounding of the adjacent consonantal element (Kossmann 2013, 172).

3.8. Velar Plosives

3.8.1. /k/

CA ك is realised as a velar plosive /k/, by raising the back of the tongue towards the palate. It occurs in aspirated and unaspirated variants. The former is the default realisation, e.g., *kān* 'he was', while the latter occurs due to the de-pharyngealisation of /q/, e.g., *ka-yəmši* 'he is/was going'. The distinct character of the two variants of /k/ is confirmed both by their F2 and by their voice onset time (VOT) value.[23] Thus, while the F2 of /k/ in *ka-truḥ* 'she is going' is 1277.06 Hz, the F2 of /k/ in *kādu* 'it hurt him' is much higher at 1863.47 Hz. Additionally, the aspirated /k/ has a much longer VOT: the VOT of /k/ in *kādu* is 36ms, but in *ka-truḥ* is only 15ms.

3.8.2. /g/

The shift of /q/ > /g/ is a well-known feature that characterises Bedouin dialects across the Arabic-speaking world. In both the Muslim and the Jewish dialect of Gabes, this sound is phonemic,

[23] Voice onset time is the time interval between the release of the stop burst and the onset of voicing.

although its distribution in the former is undoubtedly much higher (Skik 1096, 95).[24] I have found only one minimal pair in Jewish Gabes where the opposition q/g is phonemic, namely, *yqərqər* 'he drags' : *ygərgər* 'he gargles, he talks a lot'. The minimal pair provided by Cohen (1975, 31) for Jewish Tunis, i.e., *kād* 'it was a pity for him' : *gād* 'he led an animal', is not valid in Jewish Gabes, as the form of the latter verb is *gəyyəd*. In a similar vein, the opposition between /g/ and /x/ found in Jewish Tripoli, i.e., *gdəm* 'he bit' : *xdəm* 'he worked', is not attested in Jewish Gabes, as the former verb is not used in this dialect (*ʕāḍ* is used instead). Indeed, the occurrences of the /g/ sound in Jewish Gabes are much more limited and usually either stem from a sound change or are found in a lexical borrowing. For example, when the voiceless velar /k/ is followed by a voiced consonant, it shifts to /g/, e.g., *gdəb* 'he told a lie' (< CA *kaḍaba*). In some words, however, it represents CA *qāf*, which is also pronounced as /g/ in Bedouin dialects. In Jewish Gabes, most of the words containing /g/ are related to agriculture, natural phenomena, or animals, e.g., *bagra* 'cow', *gumra* 'moon', *nāga* 'female camel'. The geographically closest Bedouin dialect to Jewish Gabes is the dialect of El-

[24] In neighboring Muslim and Bedouin dialects, one finds more minimal pairs of /q/:/g/. For instance, in the Abadite Djerba dialect (Behnstedt 1998, 57), as well as in Jewish Wad-Souf (Gebski, forthcoming a), the phonemic status of /g/ is proved by the pair *grīb* 'near': *qrīb* 'relative'. In Jewish Gabes, both words are rendered as *qrīb*.

Ḥāmma, in which the shift from /q/ to /g/ is almost a rule (Cantineau 1960, 208).[25] It is thus reasonable to assume that, in Jewish Gabes, this consonant has emerged through contact with Bedouin dialects, specifically by borrowing lexical items containing /g/. In addition, it is worth noting that the shift from CA /q/ to /g/ is also present in some rural dialects of Algeria, as well as in Jewish Algiers to a limited extent. Marcel Cohen (1912, 46) claims that plosive post-palatal realisation of /q/ is, similarly to in Jewish Gabes, audible in "objets venus de la campagne ou qu'on ne connaît qu'à la campagne." Interestingly, a close examination of some contemporary recordings of native speakers of Jewish Algerian Arabic from Wad-Souf reveals that, unlike in other Jewish dialects of the Maghreb, /g/ is found not only in words related to agriculture, such as *gəmaḥ* 'wheat', but also in high-occurrence verbs of everyday use: *ḥatt yərgud* 'until he fell asleep', *gūm*! 'wake up!', *gəltlu* 'I told him'.

3.9. Velar Fricative

3.9.1. /x/

The Classical consonant خ is represented by a velar fricative /x/. Its original realisation involves the raising of the back part of the tongue towards the furthest part of the soft palate. As a result, a uvular sound can very often be heard. Among the older speakers of Jewish Gabes, however, the place of articulation of this consonant is moved forward to the region of the hard palate, and hence

[25] As pointed out by Cantineau (1960, 208), /q/ in the dialect of El-Ḥāmma has been preserved only in lexical items borrowed from CA.

the uvula does not take part in the articulation. On the other hand, younger speakers, who grew up in a Hebrew-speaking environment, articulate /x/ by pressing the root of the tongue towards the soft palate. This realisation is therefore probably conditioned by the influence of Hebrew. A parallel discrepancy has been observed by Marcel Cohen (1912, 30) in Algiers, where Muslim speakers pronounce /x/ in the region of the uvula, while the place of articulation among Jews is on the hard palate.[26] The velar realisation of /x/ is not attested in Jewish Tunis (Cohen 1975, 32).

3.10. Pharyngeals

3.10.1. /ḥ/

CA ح is represented by a pharyngeal fricative /ḥ/. The realisation of this consonant involves pulling the root of the tongue towards the back wall of the upper pharynx (Ladefoged 1982, 171; Watson 2002, 18). Apart from etymological ح, occurrences of /ḥ/ are produced by a sound shift of /ʕ/ followed by /h/ (see §3.16.2).

3.10.2. /ʕ/

The pharyngeal fricative /ʕ/ reflects the Classical *ʕayn.* This consonant is well preserved, and its realisation is stable among both male and female speakers.[27]

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[26] Cohen transcribes the former as /ḫ/ and the latter as /x/.

[27] As pointed out by Cohen (1912, 31), /ʕ/ in Jewish Algiers is articulated more strongly by men than by women, who tend to weaken its realisation.

3.11. Laryngeal

3.11.1. /h/

The fricative voiced laryngeal /h/ corresponds to CA ه, in which language it had a phonemic status. In Jewish Gabes, as far as I can establish, /h/ retains its phonemic status, e.g., *šhər* 'month' : *škər* 'he got drunk'. Nevertheless, it is important to notice that, although speakers are aware of the etymological /h/ and tend to articulate it in regular-tempo speech, its articulation is less audible in fast speech.

The weakening of /h/ is a phenomenon widely attested in several Jewish Maghrebi dialects. According to Yoda (2005, 75), despite the fact that many speakers of Jewish Tripoli are aware of the etymological existence of /h/, it is essentially absent in this dialect. Marcel Cohen (1975, 34) points out that even though CA ه is generally well preserved in modern Arabic dialects, among the Jews of Algiers, its realisation is weakened to the extent that it is almost completely inaudible. Similarly, in Jewish Tunis, one can find only vestiges of /h/, which in the majority of cases has been reduced to zero. The elimination of /h/ has two possible outcomes, namely, either the gemination of an adjacent consonant, or the compensatory lengthening of a vowel around the elided /h/ (Yoda 2005, 75).

Despite the general tendency towards the weakening of /h/ among the North African dialects, some Muslim dialects have preserved the original realisation of /h/, as can be found in both Muslim Tunis (Singer 1984, 60), Muslim Algiers (Cohen 1912, 32), and the Bedouin dialect of Douz (Ritt-Benmimoun 2014, 14).

Surprisingly, in respect of this feature, Jewish Gabes aligns with the Muslim dialects.

Below are presented the cases in which /h/ is retained; words in round brackets represent Jewish Tunis (Cohen 1975, 36):

- initial:
    - *hābəl* 'mad' (cf. *abāl*), *hbūṭ* 'unit of measure' (cf. *abūṭ*), *hḍaṛ* 'he talked' (cf. *aḍaṛ[ṛ]*), *hṛaḅ* 'he fled' (cf. *aṛaḅ[ḅ]*), *hrəd* 'he has been destroyed' (cf. *arəd[d]*), *hažž* 'he raised' (cf. *ažž*), *hməll* 'he got lost' (cf. *aməl[l]*);
- medial:
    - hV: *šūha* 'scandal' (cf. *šūwa*), *žīha* 'side' (cf. *žīya*), *yəhūdi* 'Jew' (cf. *yūdi*), *mənhum* 'from them', *dhəbb* 'gold';
    - hC: *mahbūl* 'crazy' (cf. *mabūl*), *mahrūd* 'rotten' (cf. *marūd*), *qahwa* 'coffee' (cf. *qāwa*), *šahwa* 'desire' (cf. *šāwa*);
- final (in a fast stream of speech, the final /h/ is occasionally assimilated to /a/):
    - *nādātha / nādāta* 'she called her', *ḍharha / ḍhāra* 'her back', *mʕāha* 'with her', *uṃha / uṃṃa* 'her mother', *ṛāẓəlha* 'her husband', *yḥabbūha* 'they love her'.

As can be inferred from the above examples, in Jewish Gabes, /h/ is retained in the initial, medial, and final positions.

However, its realisation is weakened in monosyllabic words in which /h/ is in the initial position, e.g., *(h)āk* ‘that’.

3.12. Treatment of *hamza*

CA *hamza* has disappeared from virtually all Jewish dialects of Tunisia.[28] In Jewish Gabes also, the glottal stop is completely absent and, depending on the position of *hamza* in the word, some compensatory processes can be observed.[29]

The elimination of *hamza* in word-initial position usually gives rise to a short vowel whose quality depends on the following consonant, e.g., CA *ʔuktub* > *əktəb* ‘write!’, CA *ʔummi* > *uṃṃi* ‘my mother’, CA *ʔarḍ* > *aṛḍ* ‘earth’, CA *ʔaḥmar* > *aḥmaṛ* ‘red’. As can be seen, a bilabial consonant conditions the occurrence of a rounded /u/ vowel, while a pharyngeal fricative or emphatic /ṛ/ is preceded by a low vowel /a/. In addition, verbs with first radical *hamza* have developed a sort of semi-vowel which substitutes for the elided glottal stop, e.g., *waxxər* ‘he was late’, *wakkəl* ‘he fed’. However, in a limited number of words, *hamza* disappears along with the following vowel. This occurs in nouns of frequent use, e.g., CA *ʔabū* > *ḅu* ‘father’, CA *ʔaxū* > *xu* ‘brother’; and in

[28] As pointed out by Y. Henshke (2007, 18), the realisation of /ʔ/ in the reading tradition of Hebrew among the Jews of Tunisia is essentially limited to two words, namely *nəboʔa* ‘prophecy’ and *šənʔa* ‘hatred’.

[29] In Muslim Gabes, the glottal stop has been retained in word-initial position before a vowel, e.g., *ʔism* ‘name’, *ʔaṣl* ‘origin’. Skik (1969, 97) points out, however, that the glottal stop in these words can be dropped without affecting the meaning of the item. A similar tendency to preserve the glottal stop at the beginning of a word is observed in Bedouin Douz (Ritt-Benmimoun 2014, 13).

verbs of the tenth stem, e.g., CA *ʔistaḥaqq* > *stḥaqq* 'he was in need of'.[30]

The disappearance of *hamza* in word-medial position brought about a wide range of processes. To begin with, in some words, it is simply eliminated, and no compensation occurs, e.g., CA *ʔimarʔah* > *mṛa* 'woman'. On the other hand, sometimes the loss of *hamza* results in lengthening of the adjacent vowel, e.g., CA *diʔb* > *dīb* 'jackal', CA *raʔs* > *ṛāṣ* 'head', CA *yaʔxuḏ* > *yāxəd* 'he takes'; or in the emergence of /w/ and /i/, e.g., CA *muʔaxxar* > *ṃwaxxəṛ* 'late', CA *miʔah* > *mīya* 'hundred'.

In word-final position, *hamza* is usually elided without leaving any trace, e.g., CA *samāʔ* > *šma* 'heaven', CA *badaʔ* > *bda* 'he began'. In a few cases, it brings about gemination of the preceding consonant, e.g., CA *ḏawʔ* > *ḍuww* 'light'.

3.13. Emphasis and Emphaticisation: A Cross-Dialectal Perspective

The emphatic consonants have two places of articulation, namely, the primary coronal obstruction and the secondary tongue root retraction towards the back wall of the pharynx (Ladefoged 1982, 171; Davis 1995, 465). As pointed out by Cohen (1975, 14), the emphasis in many cases does not have any particular significance from the phonological point of view and

[30] This phenomenon is widely attested in Jewish Tripoli. According to Yoda (2005, 84), the drop of the initial syllable was brought about by the stress shift from paroxytone to oxytone due to frequent use of the construct state with pronominal suffixes, e.g., CA *ʔabūna* 'our father', CA *ʔabūka* 'your father', etc.

is optional, but has an emotional and expressive function and therefore often occurs in words designating members of the family, taboo words, or words of foreign origin. Nonetheless, a high occurrence of emphatic consonants is among the characteristic features of Jewish Tunisian dialects and therefore deserves close examination within Jewish Gabes. Cohen (1975, 14) notes that, when Muslim residents of Tunis tried to imitate the Arabic of their Jewish neighbours, they would use exaggerated emphasis.

One of the properties of this group of consonants is that they can affect their phonetic environment through spread of the pharyngealisation to adjacent consonants and vowels, which become rounded and deeper. This phenomenon is widely attested in many Semitic languages, such as Hebrew—where, for instance, in the *hitpaʕel* stem, an emphatic first radical turns the plain /t/ of the stem's prefix into emphatic /ṭ/—and North-Eastern Neo-Aramaic dialects (Napiorkowska 2015, 46). Arabic dialects present differences in the directionality and the extent of emphasis spread. In some, such as Cairene, emphasis usually extends over the entire phonological word, while in others, such as the Abha dialect spoken in Saudi Arabia, emphasis does not usually spread beyond an adjacent vowel (Bukshaisha 1985, 217–19). In terms of directionality, in some dialects, emphasis is bidirectional and unbounded, while in others, such as some Palestinian dialects, only leftward spread is unbounded, while rightward spread is blocked by a several opaque elements. A similar tendency has been observed by Cohen (1975, 14) in Jewish Tunis, where the assimilatory influence of the emphasis spreads in both directions, but leftward spread is much more frequent than rightward

spread. Arabic dialects also tend to differ in terms of the opaque elements that block emphasis spread; for example, Heath (1987) reports that, in one of the dialects of Moroccan Arabic, high non-back phonemes—i.e., /y/, /š/ and /ž/—block rightward spread, whereas in a Libyan dialect discussed by Ghazali (1977; quoted in Davis 1995, 494), only the front vowels /i/ and /e/ are opaque to rightward emphasis spread. Some elements can also block leftward emphasis spread. For instance, in a Palestinian dialect studied by Hoberman (1989, 73–97), the same type of phonemes—namely, /i/, /y/, and /š/—are opaque to both leftward and rightward spread. On the other hand, Ghazali (1977) has found that some southern Tunisian dialects lack any phonemes that are opaque to emphasis spread.

Despite the remarks above, the phenomenon of emphasis spread in the North African dialects has not yet been thoroughly studied. In particular, compared to other dialect groups, Maghrebi Arabic lacks comprehensive acoustic analyses. Some scholars, such as David Cohen (1975, 14), mention the capacity for emphasis to spread, but this is not supported by quantitative data. Therefore, the acoustic analysis of emphasis spread in Jewish Gabes that is presented in the following sections (§§3.14–3.15) is of importance both for elucidating the phonology of this language and its typological status, and for understanding emphasis spread in Maghrebi Arabic more generally.

3.14. Acoustic Data

The following study has been conducted using the software Praat. The criterion taken into consideration in establishing whether a certain sound is produced with a retracted tongue root, abbreviated as [RTR],[31] is the second formant F2, which decreases in the case of pharyngealised consonants. The data presented in Table 5 below include measurements of the frequencies of the emphatic consonants, compared to their plain counterparts. The given frequencies correspond to the syllables in bold.

The data presented in Table 5 is divided into two categories, according to the direction of the spread of pharyngealisation. There is one emphatic consonant in each of the words, which is either historically emphatic, as in *ḍṛəḅha* 'he hit her', or has acquired an emphatic nature as a result of a secondary process, e.g., *hṛaḅ* > CA *haraba* 'he fled'. Thus, in the first column are presented lexical items that possess a pharyngealised segment (hence +RTR), while the second column comprises items with corresponding plain segments (hence -RTR). The main aim of the study was to detect the direction of the spread, whether there are any elements that are opaque to the spread, and whether emphasis is anchored in every pharyngeal consonant identically or whether some pharyngeal consonants bring about a spread of emphasis beyond an adjacent sound.

[31] This is within the framework of the theory of grounded phonology proposed by Archangeli and Pulleybank (1994).

Table 5: Directionality of emphasis spread in Jewish Gabes

1. Leftward spread

	[+RTR]	[-RTR]
/q/		
1.	(1) *təṛ**qa*** 1250.66026 Hz	***kā**n* 1800.81868 Hz
	(2) ***tə**ṛqa* 1342.43292 Hz	***tə**šbaḥ* 2225.83514 Hz
	(3) ***ẓə**nqa* 1165.66389 Hz	*ṛāẓ**əl**ha* 1787.56570 Hz
/ḍ/		
2.	(1) ***aḅ**yaḍ* 1089.41890 Hz	***žāb*** 1570.77986 Hz
	(2) *ḅ**āḅ**āha* 1140.60608 Hz	
/ṛ/		
3.	*k**aḅ**ṛat* 1089.28449 Hz	*nḥ**ab**bha* 1607.00414 Hz
/ṭ/		
4.	(1) *əṣ-**ṣə**ḷṭān* 1488.24324 Hz	***sə**zra* 2043.50565 Hz
	(2) *yxayy**əṭ*** 1598.02826 Hz	***tə**šbaḥ* 2225.83514 Hz
	(3) *y**xa**yyəṭ* 2244.11668 Hz	***xa**rraž* 1537.04294 Hz
/ṣ/		
5.	***wə**ṣlu* 820.50536	***wə**žžha* 1284.4205 Hz

2. Rightward spread

	[+RTR]	[-RTR]
/ṭ/		
6.	(1) *ṭṭəyy**bi*** 1378.20092 Hz	***bī*** 2186.87534 Hz
	(2) *yəṭḷ**aḅ*** 1089.42714 Hz	*nḥ**ab**ba* 1607.00414 Hz
/ṛ/		
7.	*hr**aḅ*** - 978.36830 Hz	***žāb*** – 1570.77986 Hz
/ṣ/		
8.	*ṣ**bā**ḥa* 1270.75092 Hz	***bāš*** 2652.70550 Hz
/ḍ/		
9.	*ḍṛə**ḅha*** 1281.23549 Hz	*nḥab**ba*** 1607.00414 Hz
/q/		
10.	(1) ***qā**ltəlha* 1553.06365 Hz	***kā**n* 1800.81868 Hz
	(2) *qā**l**təlha* 1839.09118 Hz	*b**ā**l**ə**k* 1967.83617 Hz
	(3) *qāl**tə**lha* 1929.96698 Hz	***tə**šbaḥ* 2225.83514 Hz

3.15. Data Analysis

The following conclusions can be drawn from the study presented in Table 5, discussed by section number:

3.15.1. Leftward Spread

§1.1. /q/ involves a certain degree of lowering of pitch: the frequency of the syllable /qa/ is 600 Hz lower than that of the syllable /ka/ containing the plain counterpart of /q/. The low pitch of the first segment of example (1), *tạ̈rqa* 'you/she find(s)', is not necessarily the result of emphasis spread, but could be due to the consonant /r/. It is, furthermore, rather difficult to determine the status of /r/ in this word, as its low pitch could be either anchored in the adjacent /q/, or, equally, caused by the general tendency of /r/ in Jewish Gabes to become pharyngealised. Similarly, the low frequency F2 of /zə/ in *ẓ̈ənqa* in example (3) is either owing to the shift of plain /z/ to /ẓ/ or /ž/, or, alternatively, due to the following /n/, which involves lowering of the tongue root.

§1.2. An interesting phenomenon can be observed with the word *aḅyaḍ* 'white', where the emphasis originally anchored in /ḍ/ spreads over a high /y/ sound and affects the first syllable /aḅ/. In this word in other dialects, such as Abha Saudi Arabic, emphasis spread stops beyond the second /a/ and leaves the first syllable unaffected (Watson 1999, 293). For the sake of comparison, the marked syllable in example (2) has a similar frequency to that of *aḅyaḍ*, even though it does not contain any emphatic consonant. It can be assumed that it is an example of the 'emotional' emphasis mentioned by Cohen (1975, 14).

§1.3. The /ṛ/ in *kaḅṛat* brings about a lowering of the pitch of the first syllable, and /r/ should therefore be recognised as the source of the emphasis spread.

§1.4. As the examples show, the leftward spread of /ṭ/ is rather unbounded. In example (1), *əṣ-ṣəlṭān*, it affects the entire segment located to its left. Contrary to this, examples (2) and (3) demonstrate that final /ṭ/ does not bring about emphasis spread beyond an adjacent vowel. This fact constitutes a strong piece of evidence for the existence of opaque elements in Jewish Gabes; specifically, it can be assumed that high front /y/ is opaque to emphasis spread caused by /ṭ/. Interestingly, the same word *yxayyəṭ* 'he saws' in both northern and southern Palestinian Arabic demonstrates a lack of opacity (Davis 1995, 473).

§1.5. /ṣ/ causes a clear downswing in the F2 of the preceding segment /wə/, as demonstrated in the example *wəṣlu* 'they arrived'. One can expect low pitch when the approximant /w/ is followed by the back vowel /ə/, but if one compares a word which does not contain any emphatic consonant, like *wəžžha* 'her face', the F2 is much higher, by more than 400 Hz.

3.15.2. Rightward Spread

§2.6. The emphasis anchored in /ṭ/ in example (1), *ṭṭəyybi* 'you (FS) cook', spreads over the entire phonological word and brings about a drop of the F2 of the last syllable. This downswing is significant, taking into consideration the frequency of an identical segment in a non-pharyngealised word: the difference between /bi/ in *ṭṭəyybi* 'you (FS) cook' and the same segment occurring as an independent word *bī* 'in' is more than 800 Hz. This

token provides strong evidence that, in Jewish Gabes, the high consonant /y/ does not block the rightward emphasis spread of /ṭ/. Similarly, in example (2), /ab/ is strongly affected by the emphatic character of /ṭ/. However, the measurement of the F2 of the syllable /yə/ preceding the emphatic /ṭ/ in *yəṭlaḇ* 'he asks' demonstrates that it remains unaffected by emphasis (/yə/ F2: 2779.35477 Hz); this rather surprising finding can be explained by the fact that the segment in question is not part of the stem, although it is a part of the phonological word. The relationship between emphasis spread and morphology has already been mentioned by Younes (1993); in the Palestinian dialect he examined, the leftward spread of emphasis into prefixes was unstable, while the rightward spread into suffixes was obligatory. Davis (1995, 474) confirms these findings and suggests that this discrepancy is related to some sociolinguistic factors that need to be further examined. The examples that I examined in the present study indicate that, in Jewish Gabes, inflectional prefixes remain unaffected by emphasis spread.

§§2.7.–2.9. The consonants /ṣ/, /ḍ/, and /ṛ/ all display a clear tendency to lower the F2 of the preceding segments. It seems, however, that /ṣ/ causes a much deeper downswing, as demonstrated by the difference between the pharyngealised and the plain /ba/ being more than 1200 Hz (in the case of /ṛ/, the difference is approximately 600 Hz).

§2.10. The F2 of the first syllable in *qāltəlha* suggests that /q/ involves some lowering of the pharynx, but, compared to other clearly emphatic consonants, it is rather insignificant. This

is demonstrated in the analysis in that there is no drop in the F2 of the two following syllables.

3.15.3. Summary of Findings

The findings presented above suggest that Jewish Gabes exhibits an asymmetry in the direction of emphasis spread, though no unambiguous conclusions can be drawn regarding the nature of each of the examined phonemes. It would have been possible to infer that, in the dialect in question, both the leftward and the rightward spread of pharyngealisation are unbounded. However, examples (2) and (3) in §1.4. prove that for /ṭ/, the element /y/ is opaque, blocking leftward spread, though simultaneously, the same element /y/ does not block the spread of emphasis from /ḍ/ (§1.2). This phenomenon by which different emphatic consonants are unequal in their potential for causing emphasis spread is not undocumented. In Moroccan Arabic, for example, even the same phoneme can have different degrees of emphatic potential. In that dialect, as has been noted by Heath (1987, 309), emphasis spreads from /ṛ/ onto adjacent coronal consonants in most cases, e.g., *ḍṛəṣ* 'study', but there are several examples in which /ṛ/ does not bring about the emphaticisation of an adjacent coronal, e.g., *tṛab* 'dirt'. It should be stressed that /t/ remains unchanged in this example even though it occurs directly to the left of /ṛ/, where one would expect unblocked emphasis spread.

Therefore, in light of what has previously been said, an alternative classification should be offered. Following Napiorkowska (2015, 70), who applied Ladefoged's (1971) approach based on the assumption that the features of sounds are gradable and

not distinctive, we can classify the emphatic consonants in a descending scale, where (3) conveys the strongest type of emphasis in terms of spreading into an adjacent consonant, while (0) conveys the weakest one:

Table 6: Emphasis spread scale

3	2	1	0
/ḍ/	/ṣ/, /ṛ/	/ṭ/	/q/

3.16. Assimilation

In this section, I will discuss partial and total assimilation.

3.16.1. Partial Assimilation

The notion of partial assimilation in fact comprises several other phonological phenomena, such as voicing, devoicing, and nasalisation, due to which a sound change occurs. As pointed out by Cohen (1975, 44), the assimilation in Jewish Tunis is mostly regressive, i.e., it affects consonants preceding the sound that is the trigger of the assimilation. Below one can find some of the most common examples of assimilation in Jewish Gabes:

a) voicing: may occur when a voiceless fricative is followed by a voiced plosive, e.g., *iẓḍaḍ* 'he hunts' (<CA *iṣṭāḍ*), *gdəb* 'he lied' (<CA *kadaba*);
b) devoicing: is prone to take place when a voiceless plosive or fricative is preceded by a voiced plosive: *txəl* 'he entered' (<CA *daxala*), *tkər* 'masculine' (<CA *ḏakar*), *pḥər* 'sea' (<CA *bḥar*);
c) place assimilation (in the velar environment): a consonant preceding a velar/uvular plosive phoneme receives

its velarised allophone, e.g., *zəŋqa* ‘blind alley’ (< *zənqa*), *ŋkətbu* ‘we write’ (< *nkətbu*), *yəŋqaṣṣ* ‘it is cut off’ (< *yənqaṣṣ*);

d) labialisation: can take place when /m/, /ṃ/, or /ḅ/ precedes /ey/ or /i/, e.g., *əṃṃʷi* ‘my mother’, *ṃʷəyya* ‘water’, *təṣṛḅʷi* ‘you (FS) drink’.

3.16.2. Total Assimilation

Similarly to partial assimilation, the total kind is also conditioned by a certain phonetic environment. Below are listed the most common cases of total assimilation in Jewish Gabes:

a) ln > nn; there are numerous cases of the assimilation of /l/ to /n/, e.g., *ma ʕmənna šəy* ‘we did not do anything’ (< *ʕməlna*), *ʕṭāwənna* ‘they gave her to us’ (< *ʕṭāwəlna*);

b) nl > ll; contrary to the previous case, when /n/ is followed by /l/, it gives rise to doubled /ll/, e.g., *willʕabu*? ‘where did they play?’ (< *wīn lʕabu*);

c) nr > rr, e.g., *məṛṛāẓəl* ‘from man’ (< *mən ṛāẓəl*);

d) nm > mm, e.g., *kāmma* ‘if not’ (< *kān ma*); elision of /n/ and subsequent gemination of the following /m/ is particularly common on the border between two phonological segments;

e) qk > qq, e.g., *fūqqəm* ‘above you (PL)’ (< *fūqkəm*);

f) ʕh > ḥḥ, e.g., *ntāʕha* > *ntāḥḥa* ‘her’.

4.0. Vowels

4.1. General Characteristics

One of the most conspicuous characteristics of the phonology of North African Arabic dialects is the relatively poor inventory of vowel phonemes.[32] This has already been mentioned by Cohen (1975, 46) in his description of Jewish Tunis, though he simultaneously points out that, compared to other Maghrebi dialects, the vowels in that dialect demonstrate a fairly high level of diversity. The study presented here attempts to establish the phonemic vowel inventory of Jewish Gabes as opposed to other Maghrebi dialects, as well as to outline some challenges in the examination of vowels in modern Arabic dialects.

Among the most significant parameters in the investigation of vowels is the opposition between short and long vowels. In this respect, several modern Maghrebi dialects display a considerable reduction of the short vowels inventory, resulting in the existence of a single phonemic short vowel /ə/. Yoda (2005, 31) notes that this development has so far been attested in Jewish Tripoli, Jewish Algiers, Djidjelli, and Jewish Constantine. In addition, according to Behnstedt (1998, 60), Jewish Djerba also features only one phonemic vowel /ə/. D'Anna (2021, 17) also reports only one phonemic short vowel in Jewish Yefren (Libya). Moroccan Arabic presents rather a similar system of long vowels to the above-mentioned dialects, which Heath (1987, 23) terms 'full', but only two

[32] In this respect, Maghrebi Arabic demonstrates similarity to Berber (Kossmann 2013, 174).

phonemic short vowels, namely /ə/ and /u/. From the perspective of language contact, the same reduction of vowel inventory is also found outside Arabic in the Maghrebi Arabic speech region, namely, among all the northern dialects of Berber (Kossmann 2013, 171).

Jewish Gabes distinguishes between three phonemic long vowels: /ī/, /ā/, /ū/, and three phonemic short vowels: /a/, /o/ and /ə/.[33] Its phonemic inventory is therefore more diverse than that of Jewish Tripoli and resembles the phonemic vowels of Jewish Tunis. However, it is important to note that the /ə/ vowel has multiple qualities which, in turn, depend on the consonantal environment. Kossmann (2013, 174) observes that the flexibility of /ə/ in terms of its quality is among the parallels between Maghrebi Arabic and northern Berber.

Establishing the quality of /ə/ accurately is rather challenging for several reasons. First of all, the quality of /ə/ does not depend purely on adjacent consonants, but may also sometimes be influenced by remote elements found in non-adjacent syllables. In addition, one needs to bear in mind that the realisation of a vowel which does not possess phonemic status can vary from speaker to speaker and is prone to reflect the individual's physical formation of the speech organs, level of education, usage of other languages, etc. An attempt to precisely determine the allophones of the short vowel in Jewish Tripoli has been presented by Yoda (2005, 32), who establishes 10 allophones. As the classification of these allophones is rather abstract and tentative, in

[33] However, the phonemic status of /o/, as will be demonstrated, is uncertain.

the present study of Jewish Gabes I have opted, instead, to analyse the major phonemic vowels of the dialect (/o/ has been excluded from this analysis due to its limited occurrence), which are presented in the form of plots within various consonantal environments.

4.2. Long Vowels

From a cross-dialectal perspective, the North African dialects can be divided into two groups with respect to their inventory of long vowels, namely, dialects with three long vowels: /ī/, /ā/, and /ū/, and dialects with five long vowels: /ī/, /ā/, /ū/, /ē/, and /ō/. This discrepancy stems from the different development of the diphthongs /aw/ and /ay/, which in the first group shifted respectively to /ū/ and /ī/, but in the second one to /ō/ and /ē/ (Yoda 2005, 32; Ritt-Benmimoun 2014, 25). Almost all the sedentary dialects belong to the group with three long vowels, and the Bedouin ones to the group with five. One would expect, therefore, that the long vowel inventory of Jewish Gabes, as a dialect of the sedentary type, will consist of three vowels. The Muslim dialect of Gabes, on the other hand, features a set of five phonemic long vowels (Skik 1969, 98). Jewish Gabes does indeed have three long phonemic vowels, as can be established by the following minimal pairs:

- Phoneme /ū/:
  - /ū/ : /ə/
    ẓūṛna ‘visit (MS) us!’ : *ẓəṛna* ‘we visited’;
  - /ū/ : /ā/
    fūq ‘above’ : *fāq* ‘he woke up’;

- Phoneme /ā/:
  - /ā/ : /a/
    kbār ‘big (PL)’ : *kbar* ‘he grew up’;
  - /ā/ : /ī/
    žāt ‘she came’ : *žīt* ‘I came’;
- Phoneme /ī/:
  - /ī/ : /a/
    kbīr ‘big (MS)’ : *kbar* ‘he grew up’.

Long /ī/ in the vicinity of /ḥ/ and /x/ tends to be lowered to /ē/, e.g., [xētˁ] ‘thread’. In addition, when /ī/ is followed by an emphatic consonant, a secondary diphthongisation is produced, namely /ī/ > [əy], e.g., [sˁəyf] ‘summer’. Similarly, long /ū/, when found between two emphatic or uvular consonants, occasionally shifts to long /ō/, e.g., * *ṣūṭ* > *ṣōṭ* ‘voice’ (cf. §4.4).

4.3. Short Vowels

Based on interviews with informants, it has been established that there are three phonemic short vowels in Jewish Gabes: /a/, /o/ and /ə/. Cohen (1975, 50) reports the same set of phonemic short vowels in Jewish Tunis. The /u/ vowel appears not to be phonemic. Lucienne Saada (1963) claims that /u/ is phonemic in Jewish Djerba and adduces the following minimal pair, *rəkba* ‘riding’ : *rukba* ‘knee’, but in Jewish Gabes, these words are homonymic.[34] Behnstedt (1998, 60), on the other hand, argues that

[34] It is important to notice that Behnstedt (1998, 60), in an article written 35 years after Saada’s work, reported an absence of the phonemic

short /i/, /u/, and /a/ in Jewish Djerba have merged into a single phoneme /ə/.[35] Muslim Gabes, similarly to Jewish Gabes, has a set of three phonemic short vowels: /a/, /o/, and /i/ (Skik 1969, 100). In places where Muslim Gabes has /i/, Jewish Gabes usually has /ə/, e.g., the minimal pair in the Muslim dialect, *midda* 'give her!' : *modda* 'period', is rendered in the Jewish one as *mədda* and *mədda* respectively. Below one can find minimal pairs that prove the phonemic status of all three short vowels:

/a/ : /o/[36]

ḥabb 'he loved' : *ḥobb* 'love';

/ə/ : /a/

məktūb 'written, destiny' : *maktūb* 'wallet';

/ə/ : /ā/

žməl 'camel' : *žmāl* 'camels';

/ə/ : /ū/

šxən 'he warmed himself up' : *šxūn* 'hot'.

It has previously been mentioned that /ə/ can admit different qualities depending on its consonantal environment. In what follows, I will briefly present the allophones of /ə/ as compared to the three basic non-phonemic qualities: [e], [u], and [i]. I will

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/u/ in Jewish Djerba. He records that, similarly to in Jewish Gabes, both 'riding' and 'knee' have the same form *rəkba*.

[35] This is not the case, however, in the Malekite Arabic of Djerba, which typologically belongs to the Hilālī group (Behnstedt 1998, 60).

[36] As far as I could establish, this is the only minimal pair where short /o/ appears to differentiate the meaning. Similarly to emphatic /ṛ/, therefore, its phonemic status is uncertain.

give a general outline of the consonantal environment that each of the allophones prefers.

4.3.1. /ə/ with the quality of [e]

[e] reflecting a historical [a] quality is audible when /ə/ occurs in the vicinity of an emphatic or plain consonant, e.g., *ṭəlʕat* [ṭélʕat] 'she went out', *ḍṛəḅtu* [ḍṛéḅtu] 'she hit him', *ṣəlḷi* [ṣélḷi] 'pray!', *kəḅṛu* [kéḅṛu] 'they grew up'.

4.3.2. /ə/ with the quality of [u]

This realisation usually occurs when /ə/ is followed or preceded by a labial consonant, /r/–/ṛ/,[37] /w/, or /q/, e.g., *fəmm* [fuṃṃ] 'mouth', *rəbṭūha* [rubṭūha] 'they tied her', *məṛtu* [muṛtu] 'his wife', *wəld* [wuld] 'child', *wəžžaʕat* [wužžaʕat] 'I swam', *qəmt* [qumt] 'I/you (MS) woke up'. The /u/ vowel is also present in several items where it reflects the historical short /u/ vowel, as exemplified by *yəškut* 'he is silent', *yuṣkur* 'he thanks', and *kull* 'all, every'. Furthermore, the short /u/ vowel is observable in loanwords, as seen in examples such as *gumra* 'moon' (borrowing from a Bedouin-type variety) and *šurrīya* 'shirt'.

4.3.3. /ə/ with the quality of [i]

This realisation occurs when /ə/ is followed by /y/, e.g., *bəyyət* [biyyət] 'he spent a night', *məyyət* [miyyət] 'dead', *gəyyəd* [giyyəd] 'he led an animal', *šəyyəbha* [šiyyəbha] 'he left her'.

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[37] In Jewish Tripoli, the occurrence of /r/ or /ṛ/ brings about a quality of [e]; see Yoda (2005, 36).

4.3.4. The Distribution of /o/

It must be noticed that, although there exists one minimal pair where the /o/ quality is phonemic, the distribution of /o/ in Jewish Gabes is more limited than in Muslim Gabes or Jewish Tunis. As previously mentioned, in many lexical items containing /o/ in Muslim Gabes, its Jewish counterpart has /ə/, e.g., *modda–mədda* 'period'.[38] In addition, in Jewish Tunis, verbs of this group have a long /ā/ vowel in the 3MS form of the suffix conjugation, which shifts to short /o/ when the 2MS suffix is added, e.g., *ṭāṛ–ṭorṭ*[39] 'to fly away', *tāq–toqt* 'to support', *ḍāʕ–ḍoʕt* 'to get lost', *fāq–foqt* 'to wake up' (Cohen 1975, 103). The [o] quality in these verbs occurs usually in the environment of emphatics and labials. In the parallel forms in Jewish Gabes, /o/ tends to interchange with /u/ and /a/, e.g., *ḍāṛ–ḍoṛt / ḍuṛt* 'to roam, to go around', *ṣām–ṣomt / ṣamt* 'to fast'. Moreover, there exists a group of I-stem strong root verbs where we observe interchangeability in both the prefix and the thematic vowel, e.g., *yədxəl / yədxul* 'to enter', *yəmṛaḍ / yuṃṛaḍ* 'to get sick'. It can be established, therefore, that there exists in Jewish Gabes some level of vowel interchangeability in certain morphological environments, by which /ə/ and other phonemic and non-phonemic vowels can occur in the same form, often uttered by the same speaker. As demonstrated above by the example *ḍāṛ–ḍoṛt / ḍuṛt* 'to roam, to go around', this is

[38] Jewish Wad-Souf has preserved the historical /u/ vowel in this item, i.e., *mudda.*

[39] Cohen (1975, 48) utilises in his system of transcription various qualities of vowels. In the present study, however, when quoting examples from his grammar, I will limit myself to the basic vowel quality.

particularly the case with /ə/ and /o/–/u/ in verbs of stem I with second radical /w/ or /y/. The occurrence of the short /u/ can potentially be explained as a reflex of the historical /u/ vowel.[40]

4.3.5. Sounds Reflecting Hebrew Vocalisation Signs

Apart from the aforementioned set of three long vowels and three short ones, there are also numerous allophonic realisations of /e/ that reflect the Hebrew vocalisation signs *ṣere* and *segol* in lexical items of Hebrew origin. *Ṣere*, as pointed out by Henshke (2007, 53), is rendered as either /e/ or /i/. In the northern communities /e/ prevails, while in the south, especially in Djerba, /i/ is predominant, e.g. *yušif* (< יוֹסֵף *yosēp̄*) 'Joseph'. In the vicinity of emphatic consonants, however, *ṣere* is realised in the southern communities as /e/, e.g., *ẓaqen* (< זָקֵן *ẓaqēn*) 'old'. The realisation of *segol* is not fixed either, but rather demonstrates various tendencies. In segolate nouns, the first *segol* is usually pronounced as /i/ or /e/, while the second *segol* is as a rule reduced to /ə/, e.g., *kibəš* (< כֶּבֶשׂ *keḇeś*) 'lamb'. The realisation of *hateph-segol* is not regular either and it can be represented by either /e/ or /i/, e.g., *emona* (< אֱמוּנָה *ĕmūna*) 'faith', *imit* (< אֱמֶת *ĕmēt*) 'truth' (Henshke 2009, 55). Another sound that does not exist in spoken Tunisian Arabic but can be heard among Jews is /o/ which represents the Hebrew *ḥolem*. It is realised at times as /u/, but in the vicinity of emphatics and pharyngeals /o/ is preferred, e.g., *xəššof* (> כישוף *kiššūp̄*) 'magic' (Henshke 2009, 55).

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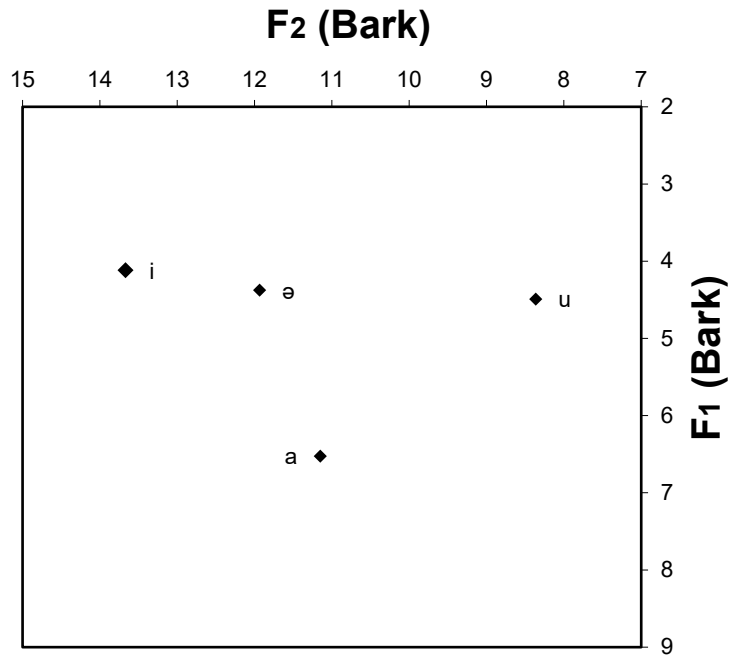
[40] This problem will be discussed in greater detail in chapter 3, §3.1.1.

4.4. Acoustic Analysis of Vowels

The following chart presents a mean plot representing the mean of all the individual tokens of the four main vowels in Jewish Gabes. Both long and short vowels have been taken into account. Formant values were obtained by means of the acoustic software Praat, which provides an acoustic analysis of speech. The horizontal axis represents the front-back quality, while the vertical axis defines the height of the vowel, i.e., the higher the value on the *x* axis, the more frontal the vowel, and the higher the value on the *y* axis, the lower the vowel. The numerical values that follow the chart are the averages calculated for each of the vowels based on fifteen allophone tokens taken from recordings of the speakers participating in the study. Below, one can find the acoustic variation of each of the vowel phonemes along with the examples. As noted in §4.1, /o/ has not been included in the analysis of the acoustic scatter of vowels due to its limited occurrence.

Figure 1: Mean qualities of the main phonemic vowels of Jewish Gabes



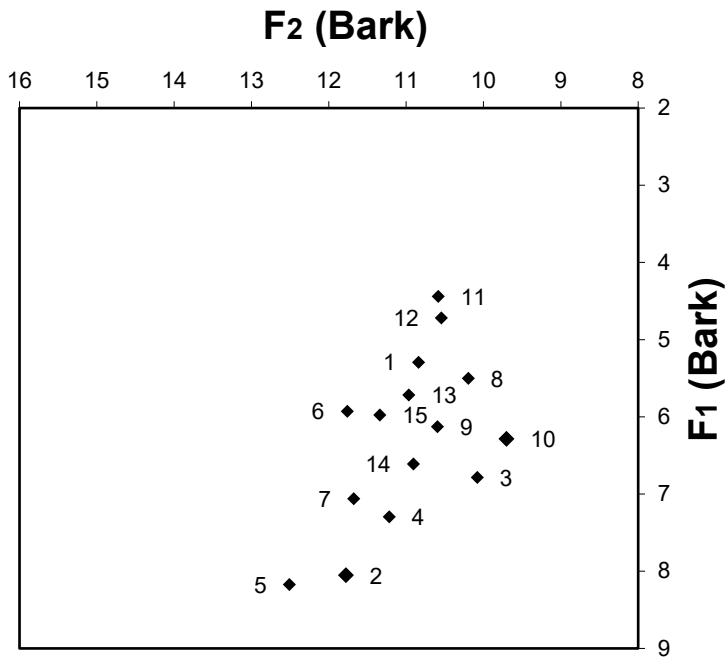
/ā, a/ 718 : 1489 Hz

/ī/ 430 : 2184 Hz

/ū/ 472 : 977 Hz

/ə/ 459 : 1674 Hz

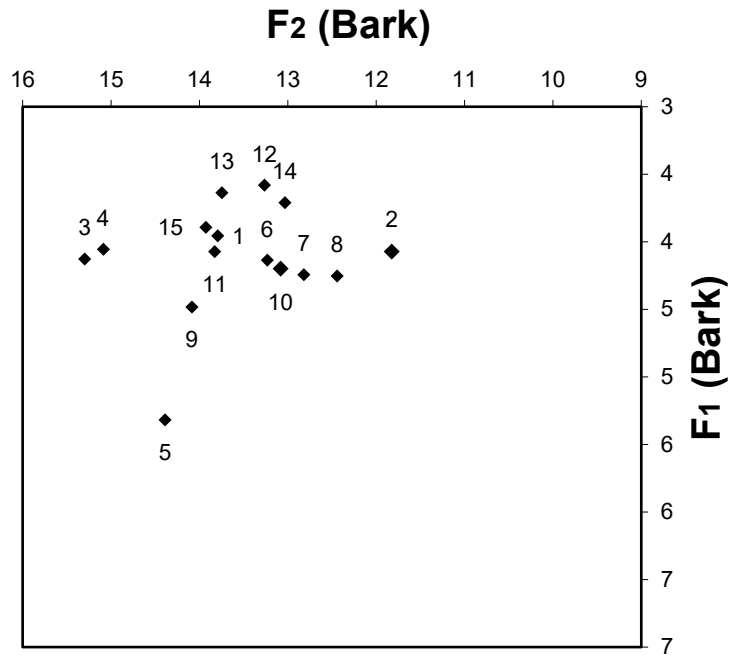
Figure 2: Qualities of /a/



1. *ān̲a* ‘I’
2. *aġ̲nī* ‘make him rich!’
3. *yəṭl̲aḇ* ‘he asks’
4. *ḍār̲* ‘house’
5. *xa̲dma* ‘work’
6. *ṣəḷṭān̲* ‘sultan’
7. *ʕa̲žiža* ‘dear (FS)’
8. *mṛa̲* ‘woman’
9. *ṣa̲naʕ* ‘maidservant’
10. *qa̲tla* ‘she told her’
11. *ra̲qdət* ‘she fell asleep’
12. *ttaḇ̲ḇaṣ* ‘you (MS) / she bend(s)’
13. *ḇāḇa* ‘father’
14. *ṭār̲* ‘it flew away’
15. *qṣa̲r* ‘castle’

As the chart demonstrates, the lowest realisations of /a/ occur in short vowels following velar or uvular consonants (5, 2), and the highest in short vowels occurring after plain consonants (11, 12). In terms of the back-front opposition, most of the back realisations appear in short vowels after emphatics (10, 8, 3).

Figure 3: Qualities of /ī/

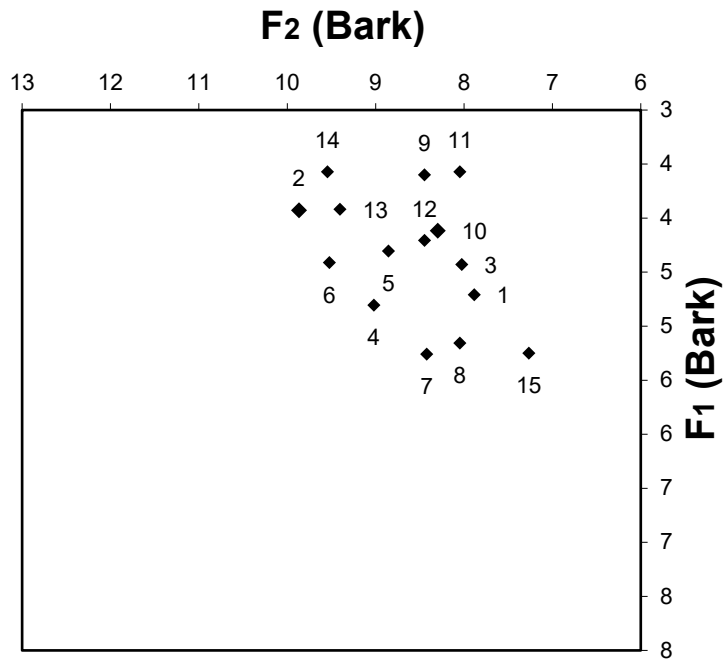


1. *bīt* ‘room’
2. *kbīra* ‘big (FS)’
3. *aḥyī* ‘make him alive!’
4. *ʕažīž* ‘dear’
5. *xlīqa* ‘figure’
6. *xīr* ‘better’
7. *brīma* ‘fine’
8. *xdīt* ‘I took’
9. *žīb* ‘bring! (MS)’
10. *kīf* ‘when’
11. *ḍāṛī* ‘my house’
12. *ṛāẓlī* ‘my man’
13. *šīd* ‘lord’
14. *ṛaḅḅī* ‘God’
15. *hādī* ‘this (FS)’

Compared to the plot of /a/ in the chart above, the scatter of the allophones of /i/ is wide with respect to the front-back opposition. The allophones with the highest values on the *x* axis are those which occur in the vicinity of the semi-vowel /y/ and the sibilants (3, 4). On the opposite side of the scale are allophones occurring next to /x/ and /ṛ/, i.e., 2 and 8, which possess a back

quality due to the retraction of the tongue root required for the realisation of these consonants.

Figure 4: Qualities of /ū/

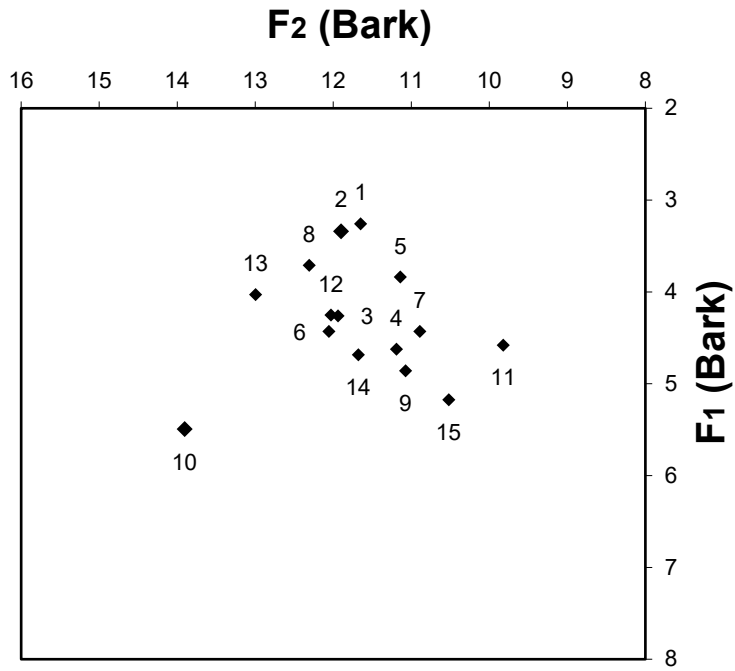


1. *farḥu̲* ‘they rejoiced’
2. *yaʕmlū̲* ‘they make it’
3. *škū̲n* ‘who’
4. *qāllu̲* ‘he told him’
5. *tū̲qaf* ‘you (MS) stop’
6. *yšūfu̲* ‘they look’
7. *nəqrāwu̲* ‘we read it’
8. *fū̲q* ‘above’
9. *yū̲žən* ‘he weighs’
10. *mā rqāwū̲ṣ* ‘they did not find it’
11. *ʕandu̲* ‘he has’
12. *kū̲l* ‘eat!’
13. *flū̲š* ‘money’
14. *lū̲la* ‘first (FS)’
15. *yqū̲llu* ‘he tells him’

The realisations of /u/ have a very wide scatter in terms of the high-low relationship. The highest tokens occur in long vowels following plain consonants (14, 9, 11). On the other hand, the

lowest realisations of /u/ are observed in the vicinity of /q/ or /r/. The back allophones of /u/ occur after pharyngeal and laryngeal consonants (15, 1), while the front realisation is found mostly in long vowels in a non-emphatic environment (2, 14, 6).

Figure 5: Qualities of /ə/



1. *ṣə̲lṭān* ‘sultan’
2. *bə̲nt* ‘daughter’
3. *mə̲rtu* ‘his wife’
4. *tə̲ṭlaʕ* ‘you (MS)/she will go out’
5. *šə̲mš* ‘sun’
6. *qṭə̲lha* ‘he killed her’
7. *raqdə̲t* ‘she fell asleep’
8. *kə̲lbək* ‘your dog’
9. *qə̲lbək* ‘your heart’
10. *lə̲qmi* ‘date wine’
11. *kəbṛə̲t* ‘she grew up’
12. *baʕtə̲thəm* ‘she sent them’
13. *aʕmə̲lli* ‘make for me’
14. *tāxə̲d* ‘you (MS)/she will take’
15. *tə̲ḍṛbu* ‘you (MS)/she will hit him’

The data presented in the chart above indicates that, even though the allophones of /ə/ have a broad scatter, the majority are realised between mid-close central unrounded [ɘ] and close-mid central rounded [ɵ]. Some allophones occurring in the vicinity of pharyngeal consonants (10, 15) possess the quality of low-mid central unrounded [ɜ]. Additionally, some variants occurring next to /q/ or pharyngealised /ṛ/ or /ḍ/ demonstrate back realisation (11, 15). It is worth noting that, in Jewish Djerba, /ə/ has a much shorter realisation, often creating an impression of a consonant cluster, e.g., Jewish Gabes: *bərša*, Jewish Djerba: *bᵊrša* 'a lot'.

4.5. Diphthongs

As has been mentioned in §4.1, many CA diphthongs have been contracted in Jewish Gabes to a single long vowel. This, however, is not the case in all other dialects of the region, and the distribution of diphthongs within the Maghrebi dialects seems to be more complex. According to the general tendency, the shift /ay/ > /ī/ and /aw/ > /ū/ is a trait of sedentary dialects, while that resulting respectively in /ō/ and /ē/ characterises the Bedouin varieties (D'Anna 2021, 17). Cohen (1975, 65), on the other hand, notes that preservation of the diphthongs is one of the characteristic traits of some Jewish Tunisian dialects, and he adduces numerous examples of lexemes containing diphthongs in Jewish Tunis which seemingly confirm this claim. However, the data from Jewish Gabes and Jewish Djerba indicate that, in contrast to Jewish Tunis, in these Jewish dialects from southern Tunisia, the diphthongs are contracted. Table 7 below demonstrates the aforementioned development of the CA diphthongs in Jewish

Gabes as compared to the Bedouin dialect of Wad-Souf from eastern Algeria, which exhibits numerous Bedouin features:

Table 7: Diphthongs in CA, Jewish Wad-Souf, and Jewish Gabes

CA	**Jewish Wad-Souf**	**Jewish Gabes**	
etymological diphthong /ay/			
dayn	*dēn*	*dīn*	debt
xayṭ	*xēṭ*	*xīṭ*	thread
xayr	*xēr*	*xīr*	better
zayn	*zēn*	*žīn*	beauty
zaytun	*zītūn*	*žītūn*	olives
ṣayf	*ṣēf*	*ṣīf*	summer
layla	*lēla*	*līla*	night
etymological diphthong /aw/			
xawx	*xōx*	*xūx*	peaches
fawq	*fōg*	*fūq*	above
lawz	*lōz*	*lūž*	almonds
mawt	*mōt*	*mūt*	death
ṣawṭ	*ṣōṭ*	*ṣūṭ*	voice
zawj	*zōz*	*žūž*	pair
lawṭa	*lōṭa*	*lūṭa*	beneath

As can be seen, the shift of /aw/ > /ū/ and of /ay/ to /ī/ is very regular in Jewish Gabes. Nevertheless, a secondary process is observed when long /ī/ is placed between two guttural or emphatic consonants, in which case it tends to be diphthongised with an additional /ə/ sound, e.g., *ṣayf* > *ṣīf* > *ṣᵊyf* 'summer'. Examples of diphthong contraction from Jewish Djerba include the following items: *žūž* (Jewish Tunis: *žawž*) 'pair', *žīt* (Jewish Tunis: *žayt*) 'oil', *žītūn* (Jewish Tunis: *žaytūn*) 'olives'. It can be established, therefore, that the reduction of diphthongs is one of the hallmarks of the southern Jewish dialects, in contrast to Jewish Tunis, where they tend to be preserved.

5.0. Phonotactics

5.1. Syllabic Patterns

The following syllabic patterns are attested in Jewish Gabes:

a) Open syllables:

- CV̄: **žā.bu** ‘they brought’;
- CCV̄: **mšī**.na ‘we went’;

b) Closed syllables:

- əC: **əš**.maʕ! ‘listen!’;
- CəC: **təb**.ki ‘you (MS) cry’;
- CCəCC: **ktəbt** ‘I wrote’;
- CəCC: **kənt** ‘I was’;
- CCCəCC: **stḥəmm** ‘he warmed up’;
- CV̄C: **qāl** ‘he said’;
- CCV̄C: **tžīb**.lu ‘you (MS) bring him’.

5.2. The Syllable Structure of Jewish Gabes as Compared to CA

In order to establish the distribution of short and long vowels in Jewish Gabes, one needs to take into consideration the diachronic development of the syllable structure of CA. In this study, I will utilise the rules of the distribution of vowels developed by Marcel Cohen (1912, 14) in his work on Jewish Algiers, and subsequently repeated by David Cohen (1975, 72) in Jewish Tunis.

Table 8: Syllable structure development in CA and Jewish Gabes

No.	Rule	CA	Jewish Gabes
1.	No short vowel is permitted in an open syllable.[1]	*jabal* 'mountain'	*žbəl*
2.	Short vowels in closed syllables of CA are represented by a reduced vowel or zero vowel.	*qālat* 'she said'	*qālət*
3.	When a word contains two short vowels in open syllables, the second one is elided in order to form one closed syllable.	*raqadat* 'she fell asleep'	*raqdət*

5.3. Epenthetic Vowel

As has previously been mentioned, modern Arabic dialects, and particularly the Maghrebi varieties, have undergone a considerable reduction of vowel inventory compared to CA. This resulted in new types of syllables and various consonant clusters that violate fixed prosodic structures attested in CA. Therefore, in order to prevent the occurrence of some sequences of consonants, an epenthetic vowel is inserted. Modern Arabic dialects deal in different ways with the insertion of an auxiliary vowel; a comparative cross-dialectal study will follow in §5.5. Below I will analyse the strategies by means of which consonant clusters are broken in Jewish Gabes.

[1] The exception to this rule is plural and singular feminine forms of the imperative of stem I, e.g., *áṣəṛbi* 'drink! (FS)', *áxəržu* 'get out! (PL)'. As pointed out by Yoda (2005, 103), the same rule is operational in Jewish Tripoli, where, however, there exist more cases of /ə/ in open syllables due to the weakening of /h/.

5.3.1. Word Initial

a) CCV-

A cluster of two consonants at the beginning of a word is generally permitted in Jewish Gabes, e.g., *tžīb* ‘you (MS) / she will bring’, *ḍṛəb* ‘he hit’, *ẓḍəm* ‘he attacked’, *tbəddəl* ‘he changed’, *ẓġār* ‘children’, *nxāfu* ‘we are scared’.

b) CCCV

This sequence is attested only in *stḥaqt* ‘I was in need of’ and *stḥəmm* ‘he warmed up’.

5.3.2. In the Middle of the Word

a) CCC

Consonant clusters in the middle of a word are prone to appear when a pronominal suffix is added to a verbal form, e.g., *ḥšəmt* ‘she put to shame’ + /-ni/ ‘me’ = **ḥšəmtni* ‘she put me to shame’. The cluster is resolved by means of a two-stage process. First of all, the stem short vowel is moved back between /ḥ/ and /š/, and then subsequently an auxiliary vowel is inserted after the first consonant of the cluster, i.e., *ḥašmətni* ‘she put me to shame’. On the other hand, the consonant cluster that occurs in 3PL prefix forms, e.g., *yəktbu* ‘they will write’, is usually tolerable in Jewish Gabes, unless the first radical is a guttural consonant. In this case, an epenthetic vowel is usually inserted, e.g., *yəxəržu* ‘they go out’, *yaʕarfu* ‘they know’. In Jewish Djerba, an epenthetic vowel tends to appear after the first radical regardless of its place of articulation, e.g., *yəkətbu* [yəkítbu] ‘they write’. The timbre of this vowel is

probably an effect of assimilation to the quality of the prefix semi-consonant /y/. The same strategy can be observed in Jewish Tripoli, i.e., *ykətbu* (Yoda 2005, 159).

b) CC

The same reciprocal movement of the schwa exemplified by *ḥašmətni* 'she put me to shame' is observable when a vocalic suffix is added to a verbal form terminating with a consonant, e.g., *ḍṛəb* 'he hit' + /-u/ 'him'. The expected form is **ḍṛəbu*; however, in that case, the syllabic division would be *ḍṛə.bu*, with a short vowel in an open syllable. As a general rule, short vowels cannot exist in an open syllable and therefore the actual form is *ḍəṛ.bu*. Another way of preventing the emergence of an open syllable containing a short vowel is by gemination of the consonant of the inflectional suffix, as in, e.g., **ḍəṛbətəm* 'she hit them'. In this case the middle /ə/ is in an open syllable, hence the /t/ is geminated in order to close the syllable, i.e., *ḍəṛ.bət.təm*.

The above examples present the process of restructuring the syllable when a vocalic suffix is agglutinated. However, when a suffix beginning with a consonant is added, no change is observed and a cluster of CCC is tolerable, e.g., *qtəlt* + /-kəm/ = *qtəltkəm* 'I killed them', since this sequence does not violate the general rule of avoiding short vowels in open syllables. Similarly, the pronoun /lə/ when added does not bring about any fluctuation in terms of syllable structure, e.g., *yərbṭu* + /lu/ > *yərbṭūlu* 'they sew him'; there is, however, a shift of the stress onto the suffix vowel of the verb.

5.3.3. Word Final

A cluster of three consonants in word-final position usually occurs when a verbal form contains both the /-t/ suffix and the negation particle /-š/. In these cases, an auxiliary vowel is not mandatory, but sometimes it is inserted, e.g., *ma xəftš* ~ *ma xəfətš* 'I did not fear'. However, clusters of three consonants in monosyllabic words are consistently resolved. The strategy in nouns differs from the strategy in verbs, namely, in verbs, an auxiliary vowel is inserted after the second radical, e.g., *gdəb* 'he lied', while in nouns, it is usually placed after the first radical, e.g., *kəlb* 'dog'.

5.4. Syllable Structure in the Perspective of Sonority

The theory of sonority states that the formulation of syllables and words in a language is motivated by a scale of sound 'strength', which places the loudest sounds in the centre of a word (nucleus) and the least audible ones either at the beginning (onset) or at the end (coda). Based on this view, the sonority sequencing principle has been developed, according to which a vowel constitutes the sonority peak in a word and consonants are organised in decreasing order. Usually, the hierarchy of sounds is as follows: vowels, liquids, fricatives, and plosives. This scale, however, differs from language to language (Ohala 1992).

In the field of the Maghrebi dialects, the theory of sonority has been used by several scholars, e.g., Philippe Marçais (1956, 112) and Marcel Cohen (1912, 140). However, the term used in French is *pouvoir ouvrant*, and their main focus is therefore not on the level of sonority of the consonants, but rather on the principles governing their placement in the word. David Cohen (1975, 79)

has developed a provisional 'sonority' hierarchy for Jewish Tunis, considering the impact it has on the syllable structure. Additionally, he points out that, compared to Muslim Tunis, the Jewish dialect is much more tolerant of consonant clusters. Below I will present a few examples from Jewish Gabes, utilising Cohen's findings.

In Jewish Tunis, liquids, pharyngeals, and labials have a strong tendency to be placed at the end of the word. Cohen (1975, 80) remarks, however, that the situation where a word terminates with a consonant cluster and the last consonant is liquid is not tolerated. Therefore, a vowel is placed between them in order to prevent the sequence of less sonorous consonants followed by more sonorous ones in the coda of a word. Jewish Gabes utilises the same strategy, disjoining clusters from CA, e.g., CA *baḥr* > *bḥaṛ* 'sea', CA *ḥabl* > *ḥbəl* 'rope', CA *laḥm* > *lḥam* 'meat'. Also, in words which in CA have two short vowels, due to the process of reduction, the short vowel is retained only between the second and the third radical, e.g., *jamal* > *žməl* 'camel'. The consonant /ʕ/ has the same disjunctive effect, since it must be preceded by a vowel, e.g., CA *dabuʕ* > *ḍbaʕ* 'hyena'. Also, in some cases /b/ brings about the insertion of the vowel, e.g., *žanb* > *žnəb*. Contrary to this, /ḥ/ can easily be found in the sequence CVCC as the third radical, e.g., *qamḥ* 'wheat'.

Word-initial clusters, in turn, are much more frequent, and even combinations of consonants that, when found in the second and the third radicals, would normally be disjointed, are permitted, e.g., *žamal* > *žməl* 'camel'. However, one can find several examples of disjunction when the second radical is a liquid, e.g., *malak* > *məlk* 'king'.

Another strategy for preventing a consonant cluster in word-initial position is insertion of the prosthetic, ultra-short vowel, which principally takes place when the first consonant is a liquid, e.g., *ᵊṛḍa* 'he agreed', *ᵊrqāw* 'they found', *ᵊntāy* 'mine', *ᵊmġarfa* 'spoon'.

However, as has been noticed by Cohen (1975, 82), there are numerous cases when the aforementioned rules are suspended due to morphological reasons. The position of the disjunctive vowel can disambiguate between a verb and a verbal noun, e.g., *ṣəṛb* 'drinking' as opposed to *ṣṛəb* 'he drank'.

5.5. The Syllabic Typology of Jewish Gabes in a Cross-Dialectal Perspective

Kiparsky (2003) has divided the dialects of Arabic into three main groups in terms of the resolving of a consonant cluster by an epenthetic vowel, namely, VC dialects (CVCC), CC dialects (CCC) and CV dialects (CCVC). Seemingly, this division does not, as shown above, apply to all dialects, and Jewish Gabes cannot be unambiguously classified as one or other of them, since there are multiple examples of all three patterns of syllabification.

Kiparsky (2003) reasons that the VC and CC dialects are different from the CV dialects in terms of the treatment of unsyllabified consonants, since, prosodically, these are affiliated directly to the word node as a semisyllable possessing the status of a mora (Watson 2007, 337). There are, however, dialects that share some features of both of the groups. Below I will present examples from several Maghrebi dialects in order to establish their typology.

Table 9: Comparison of syllable structure in selected dialects of North-African Arabic

Dialect	Example	Classification
Jewish	*qālətla* ‘she told her’	VC
Gabes	*qāltlo* ‘she told him’	CC
	nəḏfnūha ‘we bury her’	CC
Jewish	*nšədtni* ‘you asked me’	CC
Tunis[2]	*yaṛḥmu* ‘may he [God] have mercy upon	CC
	him’	VC
	yəxʾržu ‘they go out’ (> *yəxrež*)	CC
	nəfšna ‘our soul’	VC
	aṣalkəm ‘your origin’	
Jewish	*kəlbna* ‘our dog’	CC
Algiers[3]	*məṛstna* ‘our port’	CC
	mākəlti ‘my food’	VC
	bġóṛti ‘my cow’	VC
Jewish	*kčəbtləm* ‘you wrote them’	CC
Tripoli	*kčəbčələm* ‘you wrote them’	CV
	qaltla ‘she said’	CC
	yənqətlu ‘they will be killed’	VC
Bedouin	*šʲbaḥʾtni* ‘you saw me’	VC
Douz[4]	*gʲtalʾtni* ‘you killed me’	VC
	xubʾzti ‘my bread’	VC
	mākilti ‘my food’	VC
	nʲḥāṛ iž-žʲmōʕa ‘Friday’	CV
Muslim	*qalbha* ‘her heart’	CC
Tunis[5]	*žābəlkum* ‘he brought you (PL)’	VC
	žābəthāli ‘she brought her to me’	VC

[2] The examples are borrowed from Cohen (1964).

[3] See Cohen (1912, 327).

[4] See Ritt-Benmimoun (2011, 282; 2014, 76–79).

[5] See Singer (1984, 253).

As can be seen, the dialects in question represent all three types of syllable structure. Watson (2003, 340), elaborating on Kiparsky's theory, classifies Iraqi Arabic as a VC dialect, giving the example of *gilitla* 'she told her', while Moroccan Arabic is categorised as CC dialect based on the example of *qiltlu* 'I told him'. She proposes the following syllabification of the last lexical item: *qil.(t)lu*. According to this scheme, the first syllable consists of two moras, i.e., /i/ and /l/, while /q/ is perceived as a non-moraic onset. The second syllable is formed by /l/ and /u/, but only the latter has a mora. Interestingly, /t/ is analysed as an extrasyllabic element, albeit possessing a moraic status. This analysis draws from Kiparsky's (2003) theory, according to which consonants can form semisyllables. Similarly, in the first and second items from Jewish Gabes listed in Table 9 above, i.e., *qālətla* 'she told her', and *qāltlo* 'she told him', /t/ should be analysed as a semisyllable: (qal).(t).(la). The epenthetic vowel is omitted in the analysis, as its occurrence is optional.

Based on the examples provided above, it should be concluded that Jewish Gabes shares features of other Maghrebi dialects in terms of the syllable structure. Typologically, the North-African group cannot be unambiguously classified as CC dialects, as there are numerous cases of epenthesis on the left of the unsyllabified consonant, and occasionally on the right.

6.0. Stress

The placement of the stress in an isolated word in Jewish Gabes does not differ from other Maghrebi dialects. Nonetheless, as has

been observed by Cohen (1975, 84), there is a conspicuous discrepancy between the Jewish and Muslim dialects of Tunis, where Muslim speakers pronounce much stronger stress than Jewish speakers, the stress in the latter case being hardly audible. It is worth noting that the stress in Jewish Gabes, as in other North African dialects of Arabic, is mobile, namely, it can change its position in a word when the syllable structure is changed due to an agglutination of affixes or the negation particle, e.g., *mā́tət* 'she died' > *mā mātə́tš* 'she did not die'.

The rules established by Cohen (1975, 85) regarding the stress in an isolated word in Jewish Tunis are also relevant to Jewish Gabes. According to these rules, the ultimate syllable is stressed either when it contains a long vowel and is closed by a single consonant, or when it is closed by a cluster of two consonants, e.g., *xabbā́ž* 'baker', *ma ʕarfə́tš* 'she did not understand', *wṣə́lt* 'I arrived'. In turn, the penultimate syllable is stressed in all other cases, namely, both when the ultimate syllable is open, e.g., *kə́lba* 'bitch', and when it is closed, e.g., *tə́kməl* 'she finishes'.

The placement of stress can have a twofold effect. As has been observed by Cohen (1975, 88), it has an impact on both the vowels and the consonants. It is well known that stress prolongs the vowel length, as a natural consequence of the prominence given to the stressed syllable (Cruttenden 1997, 13). Interestingly, both in Jewish Tunis and in Jewish Gabes, stress can also affect consonants, when found in a monosyllabic word or in word-final position, by giving them an additional reinforcement, and in the case of labial consonants, gemination can be observed, e.g., *wəld* > *wuləddd* 'child', *hbaṭ* > *hbaṭṭ* 'he went down'.

7.0. Conclusions

This chapter has described the phonology of Jewish Gabes and its place within the Tunisian varieties of Arabic, especially the Jewish ones. As I have demonstrated, there are significant differences between the Muslim and Jewish dialects of Gabes in terms of the realisation of certain consonants. The Muslim variety aligns with Bedouin-type dialects in terms of phonological traits, while the Jewish dialect exhibits typically sedentary isoglosses. Moreover, I have demonstrated the development of diphthongs in Jewish Gabes, where /ay/ generally shifted to /ī/, and /aw/ to /ū/. This was compared to the Bedouin-type Jewish Wad-Souf dialect, where the shift is that of /ay/ to /ē/ and /aw/ to /ō/, and to Jewish Tunis, where the diphthongs are preserved. In the discussion on consonants, I have paid special attention to the development of sibilants in the region. Moreover, I have demonstrated that, in contradistinction to many dialects of the region, /h/ is generally retained in Jewish Gabes. In §§3.13–3.15, I studied emphasis spread in Jewish Gabes. The preliminary results of this analysis prove, firstly, that the pharyngealised character of /q/ is weak, and secondly, that the emphatic consonants in the dialect in question have different degrees of spreadability. In terms of the vowel inventory, I have demonstrated that Jewish Gabes has three long phonemic vowels: /ī/, /ā/, /ū/, and three short phonemic vowels: /a/, /ə/, and /o/. I have pointed out three non-phonemic qualities of /ə/, depending on the consonantal environment. My findings prove that, although the vowel inventory of Jewish Gabes is similar to that of Jewish Tunis, the distribution of /o/ in the former is much more limited. Finally, I

have shown that David Cohen's (1975, 65) argument about the tendency towards the preservation of diphthongs among Jewish dialects of Tunisian Arabic is not valid for southern Tunisian dialects, which reflect a strong contractive tendency.