

**AN OPTIMALITY THEORETIC APPROACH TO VARIABLE  
CONSONANTAL ALTERNATIONS IN QATARI ARABIC**

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## Abstract

This thesis investigates two variable phonological processes exhibited in Qatari Arabic (QA). The first is the affrication of the velar stops [k] and [g] to [tʃ] and [dʒ], respectively, a process that has been traditionally assumed to be triggered by adjacency to a front vowel. The second alternation concerns the lenition of /dʒ/ to [j], taken to be phonetically unconditioned. Previous studies, however, recognize the existence of a large number of exceptions to these processes.

By reconsidering the data in the light of new advancements in phonological theory, affrication and lenition are analyzed as regular processes, and cases that were previously considered to be exceptions to affrication and lenition are accounted for. I find that affrication can be triggered only by adjacency to [i(:)], to the exclusion of any other segment, within the stem. Also, affrication interacts with pharyngealization, a process that retracts/lowers vowels in a certain domain and removes the required context for affrication to apply. Lenition is argued *not* to be context-free, as it is blocked in coda position preceded by a non-low vowel, as well as in geminates. Exceptions to lenition are accounted for by employing the notion of prespecification/underspecification. Both processes are subject to OCP restrictions and paradigmatic effects. Typologically, the current study adds QA to the small list of languages in which lenition of an obstruent to a glide applies. It also provides evidence for considering the OCP a synchronically active constraint in Arabic, restricting segmental alternation, in addition to restricting static patterns of phonological representation.

I also argue for the inclusion of the segments /g/ and /tʃ/, which are traditionally assumed to derive from an underlying /q/ and /k/, respectively, in the phonemic inventory of QA.

The discussion is based on a large amount of data, extracted from a local dictionary and complemented by additional forms provided by the author. The analysis is cast in an optimality theoretic (OT) framework (Prince & Smolensky, 2004), which holds that linguistic forms are the outcome of the interaction among violable universal constraints, and in OT's recent development into a model that accounts for linguistic variation.

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**List of Abbreviations**

AD	Abu Dhabi
Ant.	Anterior
Approx.	Approximant
B	Bahrain
BP	Broken Plural
CA	Classical Arabic
Cont.	Continuant
Corn.	Coronal
Dors.	Dorsal
IO	Input to Output
K	Kuwait
NA	North Arabic
OCP	Obligatory Contour Principle
OO	Output to Output
OP	Optimal Paradigms
OT	Optimality Theory
QA	Qatari Arabic
SA	Standard Arabic
Son.	Sonorant
SR	Surface Representation
SSP	Sonority Sequencing Principle
Trans.	Transitive
UAE	United Arab Emirates
UR	Underlying Representation

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## 0. INTRODUCTION

The current study investigates two phonological alternations exhibited in Qatari Arabic (QA). The first alternation results from the affrication of the velar stops [k] and [g] to [tʃ] and [dʒ], respectively, a process that has been assumed to be triggered by adjacency to a front vowel, as exemplified in (1) (Cantineau, 1936, 1937; Johnstone, 1967, 1978; Maṭar, 1969, 1985; Al-amadidhi, 1985).

- (1) i. [tʃ] occurs adjacent to front vowels, [k] occurs elsewhere:
- |             |           |               |
|-------------|-----------|---------------|
| a. /kiθi:r/ | [tʃiθi:r] | ‘many, a lot’ |
| b. /kna:r/  | [kna:r]   | ‘lotus fruit’ |
- ii. [dʒ] occurs adjacent to front vowels, [g] occurs elsewhere:
- |            |          |             |
|------------|----------|-------------|
| a. /ri:g/  | [ri:dʒ]  | ‘saliva’    |
| b. /rju:g/ | [rju:dʒ] | ‘breakfast’ |

The second alternation concerns the lenition of [dʒ] to [j], which has been assumed to be phonetically unconditioned, as illustrated in (2) (Cantineau, 1936, 1937; Johnstone, 1965, 1967; Maṭar, 1969, 1985; Al-amadidhi, 1985).

- (2) a. /tɑ:dʒ/      [tɑ:j]      ‘crown’
- b. /dʒibal/      [jibal]      ‘mountain’

Both affrication and lenition are variable in QA. That is, in words in which they are permitted they only apply optionally. Nevertheless, many scholars recognize the existence of a large number of exceptions to these two processes (Johnstone, 1967, 1978; Maṭar, 1969, 1985; Al-amadidhi, 1985). That is, there are cases in which affrication seems to apply in contexts that do not involve front vowels. Also, there are cases in which affrication is blocked in the context of front vowels. With respect to lenition, although the process is

context free, there is a large number of items in which lenition is blocked.

In this thesis, affrication and lenition are reconsidered in the light of new advancements in phonological theory. The discussion is based on an unprecedented amount of data, extracted from a local dictionary (Qafisheh, 1996) and complemented by additional forms provided by the author. The whole set of data underwent grammaticality and usage judgments by at least 12 native speakers of QA. As a result, I was able to propose a coherent analysis for each process, as well as to account for the cases that were previously assumed to be exceptions to affrication and lenition, which become completely transparent.

Relevant recent developments in phonology include the restrictions imposed by the OCP (Obligatory Contour Principle) on phonological representations (e.g. McCarthy, 1986; Yip, 1988; Frisch, Broe & Pierrehumbert, 2004) and the role of perception (e.g., Flemming, 1995; Jun, 1995; Côté, 2000, 2004; Boersma, 1998; Hume, 1999; Kochetov, 1999; Steriade, 1999a, b, 2001; Kang, 2000; Hume & Johnson, 2001) and articulation (e.g. Jun, 1995; Boersma, 1998; Kirchner, 2001, 2004) in shaping the grammar. These developments establish the base for a proper account of these alternations in QA, which in turn adds to our understanding of affrication and lenition processes in general. The current study adds QA to the small list of languages in which lenition of an obstruent to a glide applies (c.f. Kirchner, 2001). Evidence is also provided for considering the OCP a synchronically active constraint in Arabic, restricting segmental alternations, in addition to restricting static patterns of phonological representation (Frisch & Zawaydeh, 2001).

Optimality Theory (Prince & Smolensky, 2004), which holds that linguistic forms are the outcome of the interaction among violable universal constraints, and its recent development into a model that accounts for linguistic variation (Anttila, 1997; Anttila & Cho, 1998; Côté, 2000; Auger, 2001; among others) provide the analytical tools necessary to account for the data on both affrication and lenition in QA.

## **0.1 Qatari Arabic**

Qatari Arabic is one of the varieties of Eastern Arabic (EA), which is a subgroup of North Arabian varieties. This subgroup also includes the varieties spoken in Bahrain, Kuwait, al-Hasa (east of Saudi Arabia), and the United Arab Emirates (Johnstone, 1967, p. 1).

According to Johnstone (1967), North Arabian varieties are divided into the following subgroups:

1. The Syro-Mesopotamian varieties.<sup>1</sup>
2. The Shammari varieties.
3. The Anazi varieties.
4. The Eastern Arabian varieties.

By the time that Johnstone investigated these varieties, the EA varieties had already been separated from the other subgroups for about 150-200 years (p.1-2). Eastern Arabian varieties share a number of characteristics. Among these are the affrication of <k> and <q>/[g], which occurs in all of the other NA varieties, and the lenition of the affricate [dʒ] to the glide [j], a process that occurs only in some of the other NA varieties (Johnstone, 1967, p. 2).

All of these varieties belong to people who were originally nomadic, but gradually settled in villages and towns, as a result of modernization of the societies they belonged to. This change in life style was very gradual in the sense that even within individual tribes, different sectors of a tribe may have urbanized at different times. This separation is one of the reasons for the difference observed in the varieties of the town settlers, or earlier settled/urbanized Bedouins, and recently urbanized Bedouins.

This situation is reflected in the Qatari society, where two sectors of the population are considered of Bedouin origin, and migrated from the Arabian peninsula to Qatar around the same time (several waves of both, in the 18<sup>th</sup>-19<sup>th</sup> c.), but one has come to be called *giba:yil* ‘tribes’, and the other *Badu* ‘Bedouin’ (Al-amadidhi, 1985, p. 36). Each of these two groups has later come to speak a different version of QA, as a result of having different social and economic life styles. From the very beginning, the former group (*giba:yil*) settled in villages and towns near the coasts, whereas the latter group “until very recently” occupied a more interior part of the country, and kept its Bedouin life style (Al-amadidhi, 1985, p. 36).

The current study investigates and analyzes the variety of QA spoken in Doha, which is the capital city of Qatar. Restricting the analysis to this locale is necessary, since in

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<sup>1</sup> Only Bedouin-origin varieties in this region.

other parts of the country, other variants of QA may be used. Being a city, Doha is characterized by the variety of the *giba:yil*. However, due to the emigration of the *Badu* to this city, and their constant interaction with the other inhabitants, the variety of Doha has come to be a mixture of the varieties of these two groups, with a strong bias towards that of the former, since this group represents “the bulk of the indigenous population” of the country, in general (Al-amadidhi, 1985, p. 36). Furthermore, for the last five decades, QA has been undergoing a process of standardization (Al-amadidhi, 1985, p. 143). With the introduction of formal education, SA is having a growing impact on the linguistic situation in Qatar. Hence, I emphasize the fact that the variety under study is QA as spoken now, at the beginning of the twenty first century, by the educated population, who have been in constant contact with Standard Arabic, and with other varieties of colloquial Arabic.

## 0.2 Outline

In chapter 1, I introduce the surface inventory of QA. I discuss the variables under study and argue for the inclusion of the segments /g/ and /tʃ/ in the phonemic inventory of QA. Traditionally, it has been assumed that [g] and its affricated variant [dʒ] derive from an underlying /q/, since /q/ is the Standard/Classical Arabic (SA/CA) cognate of [g]. Similarly, all instances of [tʃ] have been considered variants of /k/, since [tʃ] does not occur in SA/CA. The phonemic status of /g/ and /tʃ/ in QA, however, is justified by the history of these segments in Arabic, the existence of local lexical items in which these segments occur unconditionally and invariably, and by the existence of minimal pairs that distinguish between each of /g/ and /tʃ/ and the segments that are, wrongly, considered to be their Underlying Representations (UR), namely, /q/ and /k/.

In chapter 2, I present and discuss previous studies and analyses of affrication of the velar stops [k] and [g] in Arabic. In chapter 3, I revisit this process in QA. Contrary to previous analyses, I find that in synchronic QA, affrication can only be triggered if [k, g] is adjacent to high front vowels and to no other segment. Adjacency to segments other than [i(:)], including other front vowels, blocks the process. This proposal is consistent with both the cross-linguistic typology of affrication (Hock, 1991) and experimental results (Cole and

Iskarous, 2001). Affrication is triggered by a markedness constraint requiring [g] and [k] to be adjacent to some segment other than [i(:)], which interacts with a faithfulness constraint militating against modifications in place of articulation. The variability of the process is accounted for by having these two constraints crucially unranked. The domain of affrication is suggested to be the stem. Therefore, segments occurring outside this domain have no effect on the process, but internal modifications to the stem may block the process. Paradigm uniformity effects are responsible for inhibiting affrication in broken plurals, verbs, participles and verbal nouns. The process is generally blocked by co-occurrence with emphatic segments, which is reported to be the case in other varieties of Arabic as well (Cantineau, 1936; Maṭar, 1969, 1985; Johnstone, 1978). This is a natural outcome of emphasis spread, which retracts/lowers the vowels in the vicinity of emphasis, with directional and scope limitations. When /i/ surfaces retracted/lowered, it fails to trigger affrication. In addition, I suggest that affrication is blocked when the outcome would incur a violation to the OCP (McCarthy, 1986; Yip, 1988; Frisch, Pierrehumbert & Broe 2004), a highly respected constraint in QA. Apparent counterexamples to my proposal are discussed. These consist of cases of alternation between [g] ~ [dʒ]/[k] ~ [tʃ] in the context of segments other than [i(:)]. I argue that these cases involve doublets, not affrication (Mahadin, 1989), a position that is justified by the distinct behavior these items demonstrate compared to cases of unambiguous affrication.

Chapter 4 focuses on the discussion of lenition. The chapter begins with a presentation of the historical roots of the process, followed by an overview of its geographic distribution. Previous analyses and findings related to lenition are also discussed. Following Kirchner (2001, 2004), I consider lenition to be motivated by an effort-minimizing constraint named LAZY (Kirchner, 2001, p. 30). LAZY interacts with a faithfulness constraint militating against the deletion of the feature [+strident]. Although the alternation between [dʒ] and [j] seems to be generally free, I find that there are positional restrictions on the process such that lenition applies more freely in the onset as compared to the coda position, where it only applies following low vowels. Lenition never applies to geminates, which is due to the markedness of geminate glides. Lenition is found to be favored in contexts in which a faithful mapping of the underlying representation violates the OCP. On the other hand, since

lenition does not apply in all the items in which it is potentially possible for it to apply, I suggest that there are two instances of /dʒ/ in the lexicon of QA: one is underspecified for the feature [continuant] and freely undergoes lenition, the other is specified as [-continuant] and it resists the process. Further, there is a morphological restriction on the process according to which the members of each paradigm pattern identically with respect to lenition, unless the process is blocked in a certain item to conform to the requirements of dominating phonotactic constraints.

A summary of the findings and the final constraint ranking of QA are presented in the conclusion, followed by recommendations for future research.

## 1. QATARI ARABIC: SEGMENTAL INVENTORY

In this chapter, I introduce the segmental inventory of Qatari Arabic, followed by a discussion of the segments relevant to this thesis, whose classification is surrounded by controversy (§1.2). I discuss previous analyses of these segments, the alternations they are involved in, and follow the position implied in Al-Sulaiti (1993). This decision is justified by diachronic as well as synchronic considerations (§1.3, §1.4). The chapter ends with a presentation of the phonological feature specifications that are adopted for the segments under study.

### 1.1 The surface inventory of Qatari Arabic

The surface segmental inventory of Qatari Arabic (QA) consists of at least thirty consonants and eight vowels.<sup>1</sup> The consonants with their places and manners of articulation are given in table (1). The main vowels of the surface inventory of QA are given in table (2).

Table (1): The consonantal system of QA

	Bi-labial	Labio-dental	Inter-dental	Alveolar	Palato-alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Stop	b			t d tʰ			k g	q		ʔ
Affricate		f	θ ð ðʰ	s z sʰ	tʃ dʒ			χ ʁ	ħ	h
Fricative					ʃ					
Nasal	m			n						
Lateral				l lʰ						
Trill				r						
Approx.						j	w		ʕ	

(Bukshaisha, 1985, p. 13)<sup>2</sup>

<sup>1</sup> More consonants and vowels surface in QA in certain contexts, such as in the scope of emphatics where segments surface retracted and/or lowered (Bukshaisha, 1985).

Table (2): The vowel system of QA

i:	u:
i	u
e:	o:
a	ɑ:

The segments in the shaded cells in table (1) are subject to allophonic alternations, as given in (1). Interestingly, all of these segments are produced in the palatal-velar-uvular region.

- (1)
- a. [k] alternates with [tʃ].
  - b. [g] alternates with [dʒ].
  - c. [dʒ] alternates with [j].
  - d. [q] alternates with [ʁ].

While the segments [k], [dʒ], [j] and [q] are considered distinct phonemes in QA, the status of [tʃ] and [g] is a matter of controversy. The phonological/allophonic status of these segments will be discussed in the subsequent sections. The alternations listed in (1a-c) are dealt with in this dissertation, whereas (1d) is left for future research.

## 1.2 Previous approaches to the status of the consonants under study

### 1.2.1 The traditional approach

Since CA is the variety used in the transmission of the Holy Koran, it is generally regarded by Arabs as a sacred model, to which all the other varieties of Arabic need to conform. For some linguists, CA is the standard against which the dialects are compared. Any deviation from it is considered to be ‘faulty’. Further, there is a general assumption among most Arabs, including some linguists, that CA is the source from which all the modern varieties of Arabic are derived (Ayyūb n.d., p. 41; Altoma 1969, p. 5). A representative of this view is

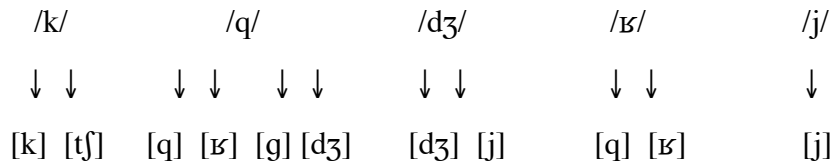
<sup>2</sup> Bukshaisha’s chart includes only the phonemes of the variety. Therefore, [ʁ] is missing from her chart since she does not consider it a distinct phoneme. Also, she considers [w] both labial and velar.



Al-Ṣāliḥ (1989) who says: “there is no doubt that the colloquial varieties are descended from and affected by *al-fuṣḥa*” (p. 360).<sup>3</sup>

Following this view, a number of linguists regard /q/ the UR from which [g] is derived. That is because the sound substitution /q/ → [g] is not evident in CA as transmitted to us through the traditional -oral- readings of Koran, and because CA [q] is the cognate of [g] in many modern varieties, including QA. According to this approach, the sole determinant of which input (UR) a surface segment represents in QA is its cognate in SA/CA (Maṭar, 1984),<sup>4</sup> or its orthographic form (Al-amadidhi, 1985, p. 76), which also coincides with the SA/CA cognate. For example, if a lexical item occurs in SA with [q], the counterpart of this segment in the QA form is considered to be derived from /q/. This treatment is not limited to [q] and its different alternates; rather, it is applicable to all the alternations given in (1) above. That is, since [tʃ] does not belong to the phonemic inventory of SA/CA, it is considered a surface variant of /k/. The traditional approach to the status of these segments in QA is as follows:

Figure 1: The traditional approach



Thus, /k/ may surface as [k] or [tʃ], the latter only in the vicinity of front vowels; /q/ may surface as either [q], [ɣ], [g] or [dʒ], the latter in the vicinity of front vowels, [g] elsewhere; and [q] and [ɣ] are in free variation (Maṭar, 1984, Al-amadidhi, 1985). The alternation between [q] and [ɣ] on the one hand, and [g] and [dʒ] on the other, is phonologically

<sup>3</sup> This word may refer to modern Standard Arabic as well as to Classical Arabic. A contrary view is held by Rabin (1978), Freeman (n.d.), Mahadin (1989), 'Anīs (1995), Wāfi (2000), among others. These scholars postulate that modern Arabic varieties developed from old varieties that were distinct from CA, rather than descendents of it.

<sup>4</sup> Although his study is based on Bahraini Arabic, he generalizes his findings to all varieties of Gulf Arabic.

unconditioned (Al-amadidhi, 1985, p. 132). Maṭar (1984, p. 148) indicates that there is a class of lexical items in which [q] and [ɣ] are the only permissible variants of /q/. This class consists of recent borrowings from SA and neologisms. However, these items could equally be argued to belong to the phoneme /ɣ/, which is considered to be /q/ by Bukshaisha (1985) and Al-Sulaiti (1993). In addition to being the output of affrication, [dʒ] is an allophone of /dʒ/, which may variably surface as [j], as will be discussed further in Chapter 4. At the same time, there exists a phoneme /j/.<sup>5</sup> Further, /ɣ/ may also freely surface as either [q] or [ɣ]. Local lexical items that occur invariably with [g] (§1.3.2.2), as well as those that occur invariably with [tʃ] (§1.4.2.1), are not accounted for in this traditional framework.

### 1.2.2 Alternative approaches

Bukshaisha (1985, p. 17) considers the segments /k/, /tʃ/, /g/, /q/, /dʒ/, and /j/ to be members of the phonemic inventory of QA. However, with the exception of /q/, which she indicates to be freely realized as [q] or [ɣ], each of these segments has only one surface representation, identical to its UR, as shown below.

Figure 2: Bukshaisha (1985)

/k/	/tʃ/	/g/	/q/	/dʒ/	/j/
↓	↓	↓	↓ ↓	↓	↓
[k]	[tʃ]	[g]	[q] [ɣ]	[dʒ]	[j]

Although her study is concerned with QA, Bukshaisha fails to mention the variability in the realizations of /k/, /g/ and /dʒ/. It is therefore plausible that she treats lexical items in which such alternations are possible as lexically distinct.

Hussain 1985 is based on the varieties of the Arab countries in the Gulf region,

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<sup>5</sup> /j/ may alternate with [w] and [i:] in certain contexts, but these alternations are not relevant to the current study.

which include QA. The author recognizes the phonemic status of /k/, /tʃ/, /g/, /q/, /ɣ/, /dʒ/ and /j/. However, /q/ is suggested to be restricted to lexical items with religious status. He says: “although /q/ is consistently replaced by voiced velar /g/ in GAD,<sup>6</sup> it still occurs in some words which have religious status as in /qurʔa:n/ “Koran”” (p. 7). Hussain describes the alternation of [k] with [tʃ] as an “occasional process” for which he does not specify a context (p. 10). On the other hand, [g]’s alternation with [dʒ], and [q]’s alternation with [ɣ] are missing from his study. However, Hussain recognizes /dʒ/’s realization as [j], which he reports to be the norm, unless the alternation would incur a semantic or lexical violation (p. 14). So, for Hussain, the situation is as follows:

Figure 3: Hussain (1985)

/k/	/tʃ/	/g/	/q/	/ɣ/	/dʒ/	/j/
↓ ↓	↓	↓	↓	↓	↓ ↓	↓
[k] [tʃ]	[tʃ]	[g]	[q]	[ɣ]	[dʒ] [j]	[j]

Following Bukshaisha (1985), Al-Sulaiti (1993, p. 6-7) considers the segments /k/, /tʃ/, /g/, /q/ to be distinct phonemes in QA, in addition to /dʒ/ and /j/. However, Al-Sulaiti recognizes the variability in the realization of /k/ as [k] or [tʃ], that of /g/ as [g] or [dʒ], that of /q/ as [q] or [ɣ] and that of /dʒ/ as [dʒ] or [j], in “certain environments” that she does not specify, except for the uvulars [q] and [ɣ], which she indicates to be used “interchangeably”. The situation according to Al-Sulaiti is given in figure (4), which is also the position adopted in the current study.

Figure 4: Al-Sulaiti (1993)

/k/	/tʃ/	/g/	/q/	/dʒ/	/j/
↓ ↓	↓	↓ ↓	↓ ↓	↓ ↓	↓
[k] [tʃ]	[tʃ]	[g] [dʒ]	[ɣ] [q]	[dʒ] [j]	[j]

<sup>6</sup> GAD refers to Gulf Arabic Dialect.

### 1.2.3 Summary

Both the traditional and all the alternative approaches acknowledge the phonemic status of the segments /k/, /q/, /dʒ/ and /j/. But there is no total agreement on the following points:

- a. Bukshaisha (1985), Hussain (1985) and Al-Sulaiti (1993) agree on the phonemic status of /tʃ/ and /g/.
- b. The traditional view and Hussain agree on the phonemic status of /ɣ/.
- c. [ɣ] and [q] variation is recognized by the traditional view, Bukshaisha and Al-Sulaiti. However, for the traditional view, [ɣ] and [q] may be the output of /q/ or /ɣ/, whereas for Bukshaisha and Al-Sulaiti, these variants are the output of only /q/.
- d. The alternation between [g] and [dʒ] is recognized by the traditional view and by Al-Sulaiti. The traditional view agrees with Hussain and Al-Sulaiti in recognizing the alternations of [dʒ] and [j], and of [k] and [tʃ].

Point (a) is addressed in the remainder of this chapter. Point (d) is the topic of the following chapters.

## 1.3 The phonological status of [g]

Traditionally, it is assumed that in the spoken varieties of Bahrain, Kuwait, Qatar, the UAE, Saudi Arabia, Iraq and certain parts of the Levant, and in the speech of the Bedouins in the Arabian deserts in Asia and Africa, [g] is a variant of an underlying /q/ (Martinet, 1959, p.99; Al-Ani 1978, p. 108; Johnstone, 1978,<sup>7</sup> p. 285; Maṭar, 1985, p. 146; Al-amadidhi, 1985, p. 85). Yet, others, such as, Cantineau (1936, p. 28), who investigated the Bedouin varieties of the Levant, Bukshaisha (1985, p. 17) and Al-Sulaiti (1993, p. 6-7), who investigated QA, and Hussain (1985, p. 8), who investigated Gulf Arabic in general, recognize the phonemic status of this segment.

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<sup>7</sup> In Johnstone (1967), the author seems to be avoiding the issue of specifying the underlying representation of this category, though, he mentions that g corresponds to q, but in his 1978 article, it is more obvious that he treats [g] as a variant of /q/.

### 1.3.1 Historical background

Diachronically, the uvular stop /q/ was at some early stage the underlying representation of [g]. However, this need not be the case synchronically, as will be explained below. Arabic /q/ is inherited from Proto-Semitic and unconditional /q/ → [g] substitution is not a recent phenomenon. Martinet (1959, p. 99) says that “pendant longtemps, [g] a dû être pour eux la variante bédouine de leur q”. In addition, Al-amadidhi (1985, p. 29) reports that “/q/ was first fronted to produce the voiced velar stop [g]....at some later stages this /q/ was fronted to yield the affricated [dʒ]”. The first change is suggested to have occurred around the eighth or ninth century, but no date is given for the second change (Al-amadidhi, 1985, p. 29). However, as is still currently the case, q > g substitution was not attested in all the varieties of Arabic at the time.<sup>8</sup> The Old Grammarians discuss the different pronunciations of <q> and attribute them to certain tribes. In his book, *Al-sʿāhibi*, Ibn Fāris (1993, version, p. 57), a linguist from the 4<sup>th</sup> Hijri/10<sup>th</sup> AD, cites another scholar from that era mentioning that the sound used for <q> by the tribe of Tamīm<sup>9</sup> is “between <q> and <k>”. Based on this text, Maṭar (1985, p.152-153, 1969, p. 33) concludes that the tribe of Tamīm pronounced <q> as [g], not [q]. Also, Wāfi (2000, p. 99) suggests that Tamīm pronounced <q> as [g], which is, according to him, “identical to the pronunciation that occurs in most of the modern Arabic dialects”. He adds that this pronunciation of <q> was attested by Ibn Khaldūn (1332-1406 A.D.), an Arab sociologist, who reports that producing <q> as [g] “was not innovated by the generation of his time” and that some scholars believed that it was “inherited from their ancestors, the Muḍarī people” (Ibn Khaldūn III, n.d., p. 1283), who constitute a major

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<sup>8</sup> About the different varieties of Arabic during that period, see Al-ʿAnṭakī (1969, p. 92), Al-Šāliḥ (1989, p. 64), Al-Rājiḥī (1969, p. 40) Al-Jundī (1983, p.132), Hilāl (1993, p. 105-106), ʿAnīs (1995, p. 46) Ḥijāzī (n.d., p. 234) Wāfi (2000, p. 98) Rabin (2002, p. 35-36).

<sup>9</sup> Tamīm is a big tribe, from which many sub-tribes descend. These sub-tribes occupied the middle territory of the Arabian Peninsula, the eastern territory including southern Iraq and Bahrain (Al-Muṭṭalibī, 1978, p.38; Ḥasan, 1998, p. 20). It is worth mentioning that, at the current time, a portion of the population of the east of the Arabian peninsula descend from this tribe (Al-amadidhi, p. 41), including the ruling family in Qatar (Johnstone, 1967, p.xxiii).

branch of the North Arab tribes.<sup>10</sup> Further, Ibn Khaldūn suggests that this sound substitution -[g] for [q]- could have been exhibited even in the variety of the prophet Mohammed himself (6<sup>th</sup>-7<sup>th</sup> c. A.D.) (see, Wāfi, 2000, p. 99; 'Anīs, 1992, p. 85).

Based on a text written by Abu Ḥayyān Al-Nahawī (1256-1344 A.D.), Al-'Anṭākī (1969, p. 156) concludes that the development of [q] to [g] is very old. In his book, *irtifāf al-d<sup>ʿ</sup>arb min lisān al-ʿarab*,<sup>11</sup> Abu Ḥayyān reports that in his time, the Bedouin tribes in Morocco and Algeria pronounced <q> as a voiced <k>, that is [g], which is according to Al-'Anṭākī (1969, p. 156-157), the current pronunciation among Arabs in the “Peninsula, Iraq and among all of the Bedouins in the Arabian deserts”. Furthermore, some linguists suggest that the description given by the Old Grammarians to CA <q> coincides with the modern Bedouin's pronunciation of that phoneme, which is [g]. Thus, Cantineau (1950, p. xxvi), Al-Muṭṭalibī (1978, p. 103-104), Bergsträsser (1983, p. 162 & 187) and 'Anīs (1992, p. 85 & 208) attribute a voiced feature to CA <q> (cf. Moscati, 1969, p. 37). However, except for Al-Muṭṭalibī, these scholars consider CA <q> to be an emphatic version of [g]<sup>12</sup> (see also, Ḥijazī, n.d. p. 301).

In conclusion, [q] has been substituted by [g], unconditionally, in at least some varieties of Arabic for a very long time (about twelve centuries). In other words, [q] did not surface as a variant of [g] in these varieties for more than eleven centuries,<sup>13</sup> which clearly argues against /q/ being the UR of [g].<sup>14</sup> The inadequacy of considering /q/ the UR of [g], and of SA/CA in general being the UR of the modern local varieties, is demonstrated in §1.3.2.

<sup>10</sup> For the different branches from which the Arab tribes descend, see Al-Rājhi (1969), Sallūm (1986), Al-Nāser (2004).

<sup>11</sup> This reference is a manuscript in a museum in Syria and was not available to me.

<sup>12</sup> The Bedouin varieties investigated by Johnstone (1967) have [g], while those that are investigated by Cantineau (1936, 1937) and Maṭar (1967) have a sort of emphatic [g].

<sup>13</sup> Except, perhaps, when codeswitching to CA.

<sup>14</sup> Currently, [q] is substituted by [ʔ] in the varieties of the major cities in Egypt and the Levant and in Fez, by [k] in certain rural areas in Palestine, and by [g] in Libya, middle and lower Iraq, the Gulf region, certain parts of Sudan and in all the Bedouin varieties across the Arab World (Mahadin, 1989, p. 20; Maṭar, 1969, p. 47; Al-Ani, 1978, p. 105-109; Kaye & Rosenhouse, 1997, p. 266-270; Wāfi, 2000, p. 107; Bahloul, 2005).

Section 1.3.2 provides an example for the failure of this approach for accounting for the process of affrication, which is one of the phonological processes dealt with in this dissertation. Other issues that are dealt with and which constitute problems for this approach are local lexical items that surface invariably with [g] and minimal pairs that demonstrate that [g] and [q] are used contrastively.

### *1.3.2 Problems for considering /q/ the UR of [g] in contemporary varieties*

#### *1.3.2.1 The case of affrication in Bahraini Arabic*

Based on the assumption that CA -or Standard Arabic (SA)- is the UR of modern Arabic varieties, Maṭar (1985, p. 147) specifies the context for the application of /q/ affrication to [dʒ] in a Bahraini variety (the dialect of al-Mharrag). He suggests that affrication takes place in adjacency to front vowels, otherwise /q/ surfaces as [g]. According to Maṭar, the inputs of the rule are the SA forms,<sup>15</sup> which usually have different vocalic patterns than those of the Bahraini. As it is shown below, this strategy cannot account for some of the data that he provides.

(2) <u>Bahraini</u> <sup>16</sup>		<u>SA</u>	
SR		UR	SR
a. [ji-rgid]	‘he sleeps’	/ja-rqud/	[jarqud] <sup>17</sup>
b. [dʒidda:m]	‘front’	/qudda:m/	[qudda:m]
c. [dʒiri:b]	‘near by’	/qari:b/	[qari:b]
d. [dʒili:l]	‘little (amount)’	/qali:l/	[qali:l]
e. [qal <sup>h</sup> b <sup>h</sup> ]	‘heart’	/qalb/	[qalb]

<sup>15</sup> Although he refers to the SA items as the sole determinants of whether or not affrication applies in a certain form in that variety, he does not explicitly state whether his analysis relies on surface representation (SR) or underlying representation (UR) of SA.

<sup>16</sup> These Bahraini items surface in QA as well.

<sup>17</sup> The phonetic details of the standard vowels may differ slightly from the broad transcription used here.

f. [gum<sup>ʕ</sup>ar<sup>ʕ</sup>]                      ‘moon’                      /qamar/                      [qam<sup>ʕ</sup>ar<sup>ʕ</sup>]

Maṭar’s treatment of the examples above indicates that his analysis is inconsistent. For example, his analysis correctly predicts that in (2a), affrication is ruled out, and /q/ surfaces as [g], because it is followed by a back vowel in SA (UR and SR). In (2b), on the other hand, affrication applies although his analysis does not predict affrication since the context is met in neither the UR nor the SR of the SA form. Furthermore, in (2c-d), affrication is correctly predicted only if the UR, not the SR, of SA is considered as will be explained in the following paragraph. But in (2e-f) affrication is correctly ruled out, only if the SR, not the UR of SA is considered. The discrepancy observed in the treatment of these examples is a natural result of considering SA the UR of the variety investigated.

Stipulating that the condition of affrication needs to be met in the surface representation of SA forms suffers from other limitations. The results of the acoustic studies on SA, carried out by Al-Ani (1970, p. 32-33), indicate that [q] has a lowering and backing effect on adjacent front vowels / i, i:, a, a:/. He reports lower F2 for vowels adjacent to [q] similar to that observed in the neighborhood of emphatics, a fact that indicates that these vowels never surface as front vowels when adjacent to [q] (see also, Ghazeli, 1977). Hence, if the context triggering affrication is considered to be adjacency to front vowels in the surface forms of SA, affrication should never apply since this context never occurs.

### 1.3.2.2 Local lexical items containing [g]

QA includes lexical items that have cognates in CA, but underwent semantic shifts. Among these are items that include [g], as the following items illustrate:

- |     |            |  |
|-----|------------|--|
| (3) | a. girad   | ‘to cause bad luck’  |
|     | b. ʔaqrada | ‘he silenced out of disgrace’                                  |
| (4) | a. ʔaqʃar  | ‘aggressive, tough (m.)’                                       |
|     | b. ʔaqʃar  | ‘a red skinned person (due to heat), s.o. who asks repeatedly’ |
| (5) | a. ba:g    | ‘he stole’   |



- |     |           |   |
|-----|-----------|---|
|     | b. ba:qa  | ‘he attacked, he lied’                  |
| (6) | a. haga   | ‘he thought, assumed’                   |
|     | b. haqa:  | ‘he talked badly about s.o., longed to’ |
|     | c. haqija | ‘he hallucinated’                       |

The items listed as (a) are drawn from QA. Those that are listed as (b) or (c) are elicited from Ibn Manẓūr (1967 version), which is considered the most comprehensive dictionary of CA, written some time between the years 1232 and 1311 A.D. The last vowel in the forms given in (3b), (5b) and (6c) represents the verb ending, which is deleted in modern local varieties. Synchronically, there is a semantic distinction between the forms occurring in QA and those drawn from CA. If CA/SA is considered the synchronic UR of these items, how can the semantic difference between the members of each pair be dealt with?

Further, there are other lexical items that occur in QA and other local varieties of Arabic that have no cognates in SA. A sample of these are drawn from QA, and are given in (7) and (8).

- |     |                                      |                           |
|-----|--------------------------------------|---------------------------|
| (7) | a. gargar                            | ‘he chattered’            |
|     | b. ḥangal                            | ‘he tripped (causative)’  |
|     | c. ʃigah                             | ‘he jumped over, skipped’ |
|     | d. giḥas                             | ‘he startled’             |
|     | e. χasbag                            | ‘he confused (causative)’ |
|     | f. s <sup>ʕ</sup> arqaʕ              | ‘he scared’               |
| (8) | a. bangah                            | ‘he cried loudly’         |
|     | b. t <sup>ʕ</sup> angar <sup>ʕ</sup> | ‘he became angry’         |
|     | c. fangaʃ                            | ‘he died’                 |
|     | d. gazzar                            | ‘he spent (time, life)’   |

e. ʔizgirti:	‘elegant’
f. simande:ga	‘useless’
g. t <sup>ʕ</sup> ar <sup>ʕ</sup> t <sup>ʕ</sup> angi:	‘worthless’
h. do:ʃag, diwa:ʃig	‘mattress, mattresses’
i. tifag, tfa:ga	‘rifle, rifles’
j. gʃa:r <sup>ʕ</sup>	‘personal belongings, grocery supplies’

The CA cognates of the items given in (7) could not be found in Ibn Manẓūr (1967 version), nor were they found to be borrowed into QA from other languages (Al-Mālikī, 2000). On the other hand, the items exemplified in (8) are borrowed into QA from different languages. However, these are so integrated into the variety that their foreign source is not apparent to a non-specialized person. That is, for an ordinary native speaker, the items given in (7) and (8) and those given in (a) of (3-6) are indistinguishable in that all of them are considered native items in the variety. When pluralized, the borrowed nouns are treated just like native nouns (8i, 8k). Interestingly, example (8h) is a borrowing from Turkish, through Farsi, and it occurs in both languages as [duʃak]. When borrowed into QA, however, the last consonant, that is [k], turns to [g]. (8c-8i) also occur in Kuwaiti Arabic, [f<sup>ʕ</sup>aŋgaʃ] for (8c), and [tif<sup>ʕ</sup>ag] for (8i), as indicated to me by a Kuwaiti informant.

To account for the local items that include [g] and have no cognates in SA/CA, one could stipulate that these items are also represented underlyingly as /q/, which cannot be supported by any kind of evidence. An alternative approach is to assume that only the local items are represented underlyingly as /g/, but not the items in which [g] is the cognate of SA [q], which are exemplified in (2). This move is not justified given that [g] in cognates and in exclusively local items behaves identically. On the other hand, abandoning the idea that SA is the UR of the local varieties and considering /g/ the UR of surface [g] provides a unified UR for all the items that surface or may surface with [g].

### 1.3.2.3 Minimal pairs

There are minimal pairs that show that the speakers of QA use [g] and [q] contrastively, that is, as distinct phonemes. Some of these are given below:

- (9)
- |                                      |               |   |   |                        |
|--------------------------------------|---------------|---|---|------------------------|
| a. gidar                             | ‘he could’    | ≠ | qidar ~ ɣidar   | ‘he betrayed’          |
| b. gas <sup>ʕ</sup> s <sup>ʕ</sup>   | ‘he cut’      | ≠ | qas <sup>ʕ</sup> s <sup>ʕ</sup> ~ ɣas <sup>ʕ</sup> s <sup>ʕ</sup>     | ‘he choked’            |
| c. gat <sup>ʕ</sup> t <sup>ʕ</sup> a | ‘he threw it’ | ≠ | qat <sup>ʕ</sup> t <sup>ʕ</sup> a ~ ɣat <sup>ʕ</sup> t <sup>ʕ</sup> a | ‘you cover him/it’     |
| d. gas <sup>ʕ</sup> s <sup>ʕ</sup> a | ‘a hair cut’  | ≠ | qas <sup>ʕ</sup> s <sup>ʕ</sup> a ~ ɣas <sup>ʕ</sup> s <sup>ʕ</sup> a | ‘a lump in the throat’ |

To sum up, the UR of the variable [g]/[dʒ] is not the uvular stop /q/, rather, it is the velar stop /g/. This position is based on the availability of local lexical items which surface with [g], and for which an UR /q/ cannot be stipulated. Further, it is supported by the existence of items in which [g] and [q] are used contrastively. The discussion is enriched by a case study which shows that considering /q/ the UR of [g] does not yield a consistent treatment of the alternation between [g] and [dʒ].

#### 1.3.3 The alternation between [q]/[ɣ] ~ [g]/[dʒ]

Having demonstrated that the segments [q] and [g] are used contrastively in QA, it is important to note that there are cases in which these segments, together with their variants [ɣ] and [dʒ], respectively, may alternate. The segments [q], [ɣ], [g] and [dʒ] may alternate in QA in the class of lexical items that are shared by QA and SA, as exemplified in (12). However this variation, as I argue below, does not derive from a shared UR.

- (10)
- |           |         |
|-----------|---------|
| a. qi:ma  | ‘price’ |
| b. ɣi:ma  | ‘price’ |
| c. gi:ma  | ‘price’ |
| d. dʒi:ma | ‘price’ |

An item that is shared by both QA and SA may surface either as in (10a), (10b), (10c) or (10d). Interestingly, however, Al-amadidhi's (1985) study reveals that in formal settings –in which SA or an elevated register of QA is the norm- the speaker's choice would be either (10a) or (10b), otherwise, the optimal choice would be either (10c) or (10d). That is, the social settings in which [q]/[ɣ] are permissible are distinct from those in which [g]/[dʒ] are. Further, items that are specific to QA and surface including [g]/[dʒ] (or only [g]) and for which SA/CA cognates do not exist may never surface with [q]/[ɣ] instead.<sup>18</sup> This suggests that only when the speaker codeswitches to SA, that is, in settings in which standard forms are desirable, do the segments [q]/[ɣ] surface instead of [g]~[dʒ]. I consider this type of alternation to be phonologically irrelevant and governed *only* by a sociolinguistic factor.

#### 1.4 The phonological status of [tʃ]

Traditionally, this sound is considered a variant of /k/, occurring in contiguity with front vowels, in some modern varieties of Arabic (Moscatti, 1969, p. 38). These include the varieties spoken in Kuwait Bahrain, Qatar, and the UAE (Johnstone, 1967, 1978; Maṭar, 1985; Al-amadidhi, 1985), and in some parts of Iraq and the Bedouin varieties in the Levant (Cantineau, 1936, 1937).<sup>19</sup> As in the case of [g], CA plays a significant role in the way [tʃ] is treated (see, §1.4.1.2). In short, because [tʃ] does not occur in CA, it is generally not considered a distinct phoneme in the modern local varieties in which the segment surfaces. However, some studies consider /tʃ/ a distinct phoneme in these varieties, in addition to being a variant of /k/ (Johnstone, 1967, 1978; Altoma, 1969; Bukshaisha, 1985; Hussain, 1985; Al-Sulaiti, 1993).

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<sup>18</sup> Items specific to QA would not be used in formal contexts.

<sup>19</sup> This process, according to 'Anīs (1995, p. 125) is conditioned by a *following* front vowel, in an Egyptian variety that he does not specify. Also, Wāfi (2000, p. 99) reports the realization of [tʃ] in colloquial Iraqi, but he does not indicate its context, or whether or not he considers it a phoneme in that variety.

### 1.4.1 Historical background

It is believed that the first mention of the voiceless affricate [tʃ] is related to a phenomenon called *kashkasha*, in the old texts (Johnstone, 1967, p. 14, 1978, p. 294-296; Al-Muṭṭalibī, 1978, p. 110; Al-Jundī, 1983, p. 361; Maṭar, 1985, p. 157). Moscati (1969, p. 38) indicates that the Old Grammarians report a “tendency  $k > c$ ”<sup>20</sup> in some of the old dialects of Arabic, in the neighbourhood of “palatal vowels”. On the other hand, Maṭar (1985, p. 161) indicates that some old texts report that the process applied to all the contexts in which the sound [k] was followed by *kasra*, that is, the vowel [i]. However, generally, it is assumed that the phenomenon was, at least at the beginning, restricted to the 2nd person feminine suffix [-ki], which surfaces otherwise as [-k] before pause. That is, the substitution was motivated by the need for the distinction between the feminine and the masculine 2nd person suffixes, whose identities would otherwise be obscured after the deletion of the gender suffix (vowel), which is an obligatory process before pause in CA. Later on, [tʃ] became the only variant of this suffix in all contexts.

(11) Within utterance	Utterance final (before pause)
maʕa-k-a ‘with-you-sg.m.’	maʕak
maʕa-k-i ‘with-you-sg.f.’	maʕak » maʕatʃ

Al-Muṭṭalibī (1978, p. 107) suggests that some of the old grammarians distinguish between two types of *kashkasha*. In the first type, the sound [ʃ] replaces the 2<sup>nd</sup> person f. suffix [k] before pause. This occurred in the varieties of some people of Tamīm and 'Asad. In the second type, [ʃ] is added after [ki], yielding [kiʃ] to save the vowel from deletion in the same context (Sībaweyh IV,<sup>21</sup> 1999, version, p. 315; Hilāl, 1993, p. 162-167; Ḥasan,

<sup>20</sup> [č] is used in the source to indicate [tʃ].

<sup>21</sup> Sībaweyh, an Arab linguist lived between 765-795 A.D., gives <ʔaʕtʕaytukif> ‘I gave you (f.)’ as an example of this type of *kashkasha*.

1998, p. 122-123; cf. Al-Jundī, 1983, p. 361). In the case of /-k/ > [-ʃ], Sībaweyh accepts the substitution even when occurring within the utterance, that is, when the gender inflection is kept intact (Sībaweyh IV, 1999, version, p. 314; Ḥasan, 1998, p. 123). Al-Jundī (1983, p. 361) assumes that after using [-ʃ] for the 2<sup>nd</sup> person feminine suffix [-k], at the end of the utterance (before pause) for some time, the substitution was generalized to other prosodic contexts.

In the case of <-kiʃ> (represented orthographically by the symbol representing [k] followed by the symbol representing [ʃ]), Al-Jundī suggests that these two letters were not actually what people articulated, and that they are a misrepresentation of the affricate [-tʃ]. That is, also /-k/ turned to [-tʃ] rather than to [-kʃ]. Al-Muṭṭalibī (1978, p. 109-110) also argues that what is indicated in the old texts by <ʃ> and <kʃ> in *kashkasha* is nothing but a misrepresentation of the sound [tʃ]. Because there was no orthographic symbol for the affricate [tʃ] in Arabic, it was written by some as <ʃ>, and by others as <kʃ> (for a discussion of the issue see Al-Muṭṭalibī, 1978, p. 109-110; Al-Jundī 1983, p. 359- 361).

While <kʃ> is likely to represent [tʃ], it can be doubted that both orthographic -ʃ and -kʃ, in the old texts, were always meant to represent the same sound [tʃ]. First, when the issue was raised for the first time, in Sībaweyh (IV, 1999, version, p. 314-315), the author differentiated between two processes occurring in the varieties of two different groups of people, and provided distinct examples for each process. Second, there is evidence for both types of *kashkasha*, that is, both processes, in some modern varieties. Maṭar (1985, p. 158-161) notices that in some villages in Bahrain, people have [-ʃ] for the 2<sup>nd</sup> person feminine suffix in all prosodic contexts. In the same dialect, [tʃ] generally substitutes any instance of [k] with an adjacent front vowel (Maṭar, 1985, p. 158-161). In other varieties, such as QA, [tʃ] occurs both as the 2<sup>nd</sup> person feminine suffix and as a variant of /k/ in the context of front vowels.

In any case, considering the studies cited above, and assuming that at least part of what is referred to by *kashkasha* is the substitution of [k] by [tʃ], it appears that at some

early stage, there were two instances of [tʃ]. The first<sup>22</sup> one is a distinct phoneme, the second, a variant of /k/, triggered by a following [i] (Maṭar, 1985, p.161). This context was later extended to include adjacency to any front vowel, as evidenced in contemporary Arabic varieties (Cantineau, 1936, 1937; Johnstone, 1967, 1978; Altoma, 1969; Al-amadidhi, 1985; Maṭar, 1969, 1985, among others). On the other hand, the phonemic status of [tʃ] was established when it was used as the only variant of the 2<sup>nd</sup> person feminine suffix. Indeed, Johnstone (1967, p. 14) argues “the suffix of the 2 f.s. in the EA dialects is *-iĉ*. The post-vocalic form is *-ĉ* whether it follows a front or a back vowel. This is not a variant of k” (also, see the discussion in Johnstone, 1978, p. 294-296). The phonemic status of /tʃ/ was reinforced by the integration of borrowings that include this segment and by cases in which [tʃ] does not alternate with [k], as will be explained below.

#### 1.4.2 Problems for denying the phonemic status of /tʃ/ in contemporary varieties

##### 1.4.2.1 Lexical items that surface invariably with [tʃ]

The voiceless affricate occurs as the only variant of the 2<sup>nd</sup> person feminine suffix, whether or not adjacent to a front vowel. It also occurs *invariably* in some lexical items for which SA/CA cognates exist, although they underwent semantic shifts in QA. These items are exemplified in (12-15). The first item in each pair comes from QA, whereas the second comes from SA/CA:

- |      |                         |   |
|------|-------------------------|---|
| (12) | a. tʃɑ:n                | ‘discourse marker meaning then, if’       |
|      | b. ka:na                | ‘he was’                                  |
| (13) | a. fatʃtʃ <sup>23</sup> | ‘he opened (the door, window)’ [footnote] |
|      | b. fakka                | ‘he disconnected, released’               |

<sup>22</sup> A relatively similar case occurs in modern Amharic, where the sounds /ʃ/, /ʒ/, /tʃ/, /tʃʰ/, and /dʒ/ are lexicalized after being only allophones of /s/, /z/, /t/ /k/, /sʰ/ /tʰ/, and /d/ /g/, respectively, in earlier stages of the language (Bergsträsser 1983, p. 135). In the source, [š] is used for [ʃ], [ž] for [ʒ], [č] for [tʃ], [j] for [dʒ], [ṣ] for [sʰ], [ṭ] for [tʰ] and [č̣] for [tʃʰ].

<sup>23</sup> For the sake of clarity, geminate affricates are represented as [tʃtʃ] and [dʒdʒ]. It should be noted however that phonetically, geminate affricates are realized with a prolonged stop stage, i.e. [ttʃ] and [ddʒ].

- (14) a. fatʃtʃa 'a gap, he opened it'  
       b. fakka 'he disconnected, released'
- (15) a. nitʃab 'he poured food into serving dishes'  
       b. nakaba 'he emptied a pot of sand or any non watery substance'

The last vowel in the second of each pair represents the verb ending, and it is deleted in modern local varieties. As in the case of the items given in (3-6), an analysis that considers CA/SA /k/ to be the UR of [tʃ] in the items above fails to account for the semantic difference between the members of each pair.

Furthermore, there is a considerable number of lexical items in modern local varieties that include [tʃ] and which have no cognates in SA/CA. A sample of these is drawn from QA, and is given in (16).

- (16) a. matʃtʃaɪ 'he plucked'  
       b. ʃitʃaf 'he braided'  
       c. tʃandas 'he leaned'  
       d. tʃikwe:ti: 'cheap goods'  
       e. tʃatti:, tʃita:ti: 'prescription, prescriptions'  
       f. katʃtʃa 'a license for getting trained in driving'  
       g. tʃabra 'fresh food market'  
       h. katʃra 'garbage'  
       i. tʃu:la, tʃwal 'stove, stoves'  
       j. tʃab<sup>ʕ</sup>b<sup>ʕ</sup> 'shut up'  
       k. ʁantʃa, ʁna:tʃ 'an oval dish, dishes'  
       l. ba:tʃa 'a traditional dish consists of lamb head and guts'  
       m. ʔatʃa:r 'pickles'  
       n. hamtʃa 'a lot, a handful'



The items given above surface invariably with the affricate [tʃ]. The first three of these (16a-c) were neither found in Ibn Manẓūr (1967),<sup>24</sup> nor were they included in Al-Mālikī (2000), in which borrowings from other languages are listed. Thus, they are probably local items that have no cognates in CA. The rest of the items in (16) are borrowings listed in Al-Mālikī (2000), and are well integrated into the system of QA. That is, for an ordinary native speaker of the variety, these items are part of the lexicon of QA, and are not distinguishable from those listed in (2). Similar to any native lexical item, when pluralized, these items may adopt the broken plural templates (16e, 16i, 16k). Item (16n), borrowed from Farsi, occurs in its source language as [hamki:] meaning ‘all’, as cited in Al-Mālikī (2000, p. 301). However, when borrowed into QA, the velar stop underwent affrication and then lexicalized as such. In addition to occurring in QA, except for (16d, 16e, 16f, 16h) the forms given in (16) occur also in Kuwaiti Arabic, as indicated to me by a Kuwaiti informant. Borrowings that include this affricate occur also in Iraqi Arabic (Altoma, 1969), UAE Arabic, and Bahraini Arabic (Qafisheh, 1996).

#### 1.4.2.2 Minimal Pairs

There are minimal pairs that show that the speakers of QA use the segments [k] and [tʃ] contrastively, that is, as distinct phonemes.

(17)	a. tʃiwa	‘he cauterized’	≠	kiwa	‘he ironed’
	b. tʃɑ:n	‘if/then’	≠	kɑ:n	‘he was’
	c. ʕind-itʃ	‘you have f.’	≠	ʕind-ik	‘you have m.’
	d. fatʃtʃa	‘a crack/he opened it’	≠	fakka	‘a relief’
	e. fatʃtʃ	‘he opened’	≠	fakk	‘he unscrewed’

To sum up, the affricate [tʃ] occurs in QA, not only as a contextual variant of the velar stop [k], but also in different kinds of contexts. It occurs, invariably, in the 2<sup>nd</sup> person singular

<sup>24</sup> [makkaʕa] has no entry in this dictionary. However, [ʕakafa], which might be the CA cognate of [ʕitʃaf] ‘he braided’ is found, but it means in CA ‘he was immersed in doing s.th.’.

feminine suffix, whether adjacent to a front vowel or not, and it occurs in the discourse marker [tʃɑ:n], preceding a back vowel (17b). Also, the affricate [tʃ] surfaces in different environments in borrowings that are integrated into the grammar of QA. More importantly, [tʃ] contrasts with [k] in a number of lexical items. Therefore, I conclude that in QA, and perhaps in other varieties, there are two instances of surface [tʃ]: one is a contextual variant of /k/; the other, a distinct phoneme.

### 1.5 The current position

Following Bukshaisha (1985), Hussain (1985), and Al-Sulaiti (1993), the segments /g/ and /tʃ/ are considered here to be distinct phonemes in QA, in addition to /k/, /q/, /dʒ/ and /j/. This position, unlike the case in previous studies, is justified by the history of these segments in Arabic, the existence of local lexical items in which these segments surface unconditionally and invariably (see §1.3.2.2, §1.4.2.1), and the occurrence of minimal pairs that distinguish between /q/ and /g/ and /k/ and /tʃ/ (§1.3.2.3, §1.4.2.2).

Although this is hardly debatable, it is essential to demonstrate that the segments /k/ /dʒ/ and /j/ have phonemic status in QA, since the analyses adopted in this dissertation rely on this assumption. That of /k/ is dealt with in the course of previous discussion of /tʃ/ (§1.4.2.2). For /dʒ/ and /j/, minimal pairs that distinguish between these segments are listed in (18). Minimal pairs that distinguish between [dʒ] and [g] are also listed (19) since these segments may alternate in the context of affrication.

- |      |               |                      |   |        |              |
|------|---------------|----------------------|---|--------|--------------|
| (18) | a. dʒɑ:hil    | ‘ignorant’           | ≠ | ja:hil | ‘child’      |
|      | b. ʔaldʒa     | ‘his mouth’          | ≠ | ʔalja  | ‘rusty (f.)’ |
|      | c. ʔadʒdʒ     | ‘pilgrimage’         | ≠ | ʔajj   | ‘alive’      |
| (19) | a. dʒɑ:ʕ/jɑ:ʕ | ‘he became hungry’   | ≠ | ga:ʕ   | ‘bottom’     |
|      | b. dʒaʕʕad    | ‘he curled (trans.)’ | ≠ | gaʕʕad | ‘he seated’  |

c. dʒarr/jarr                      ‘he pulled’                      ≠                      garr                      ‘he settled down’

With respect to alternations, the position adopted here is similar to the one suggested in Al-Sulaiti (1993). That is, /k/ may surface as either [k] or [tʃ], and /g/ may surface as either [g] or [dʒ], when the conditions for affrication are met (these conditions are elaborated in chapter 3). Also, /q/ may freely surface as [q] or [ɣ].<sup>25</sup> The affricate /dʒ/ may surface, generally freely, as either [dʒ] or [j] (see Chapter 4). However, I recognize the fact that the segments [q] and [ɣ] are possible variants of /g/, though only in codeswitches to SA/CA. My position is illustrated in Figure 5.

Figure 5: The current position

/k/	/tʃ/	/g/	/q/	/dʒ/	/j/
↓ ↓	↓	↓ ↓ ↓ ↓	↓ ↓	↓ ↓	↓
[k] [tʃ]	[tʃ]	[g] [dʒ] ([q] [ɣ])	[q] [ɣ]	[dʒ] [j]	[j]

Accordingly, in QA, the segments [tʃ], [dʒ] and [j] may correspond to two inputs. The voiceless affricate [tʃ] may be the output of /k/ in the context triggering affrication, or the output of /tʃ/ in any context. Similarly, the voiced affricate [dʒ] may be the output of /g/ in the context triggering affrication, or the output of /dʒ/ in any context. The glide [j] may be an output of either /dʒ/ or /j/.

It is worth mentioning that QA is not unique with respect to the distribution and status of its affricates. A similar case is found in Acadian French, a variety that is spoken in certain regions of the Atlantic Provinces of Canada, and some parts of Louisiana, in the United States. In this variety, the affricates [tʃ] and [dʒ] surface as contextual variants of the velar stops /k/ and /g/, respectively, in addition to being distinct phonemes, surfacing in different kinds of contexts in borrowings from English that are integrated into the system of

<sup>25</sup> Future research may reveal that this alternation is not completely context free.

Acadian (Garner, 1952; Haden, 1973; cf. Massignon, 1947; Lucci, 1973; Ryan, 1981; Flikeid 1984, 1989; Motapanyane, 1997).<sup>26</sup>

### 1.6 Feature specifications for the relevant segments

The analyses developed in this dissertation assume the feature specifications given in table (3), in which redundant features are omitted. The major place features are considered to be unary. Following Lahiri & Evers (1991), Hume (1994, 1996), Clements (1990), Clements & Hume (1995), and Hall (1997), among others, front vowels and the front glide [j] are considered to be coronal segments, and back vowels are assumed to be dorsal. I consider the affricates [tʃ] and [dʒ] in QA to be coronal (see also Watson, 2002). This conforms with the phonetic implementation of these segments and with their patterning in QA, as will be explained below, and in other varieties of Arabic (e.g. Younes, 1994, p. 219-221). Traditionally, however, the voiced affricate [dʒ] of CA is considered to be a dorsal segment due to historical considerations (Greenberg, 1950; McCarthy, 1986, 1994; Frisch, Pierrehumbert, & Broe, 2004). These scholars do not deal with the voiceless affricate [tʃ] since it is missing from CA.

In QA, the affricates [tʃ] and [dʒ] are treated as non-dorsal, therefore, coronal segments, with respect to the surface representation of the feminine suffix morpheme, as indicated by the data provided by Bukshaisha (1985) and Al-Sulaiti (1993). Generally this morpheme surfaces as [v] if preceded by one of the dorso-pharyngeal segments, otherwise it surfaces as [ʒ]. The feminine morpheme surfaces as [ʒ] when preceded by [tʃ] or [dʒ]. Also, the definite article [il-], which in CA/SA assimilates to any following coronal segment excluding the glide [j] and the affricate [dʒ], may occasionally assimilate to the affricates in QA. The fact that assimilation is not categorical in the case of the affricates should be considered a historical residue, not an indication of their being treated as noncoronal segments. This is supported by the fact that the definite article never assimilates to other segments that are not coronal.

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<sup>26</sup> These affricates surface also as variants of /t + i/ and /d + i/ in the contexts /t + i + V/ and /d + i + V/, respectively (Lucci, 1973, p. 88; Ryan, 1981, p. 116 & 118; Flikeid, 1984, p. 197; Motapanyane, 1997, p. 8).

I consider the affricates [tʃ] and [dʒ] to be [-cont] segments, distinguished from the coronal stops [t] and [d] by being [+strident] (Jakobson, Fant, & Halle 1951; Clements, 2004; Lubowicz, 2002; among others). Also, I adopt a feature geometry in which the feature [high] is applicable to consonants as well as to vowels. This feature characterizes the segments that are produced by raising the tongue body ([j, ɟ, dʒ, tʃ, g, k]) (Chomsky & Halle, 1968; Lahiri & Evers, 1991; Davis, 1995; Hall, 1997; Adra, 1999).

Table (3)

Segment	Son.	Cont.	Voice	Strident	Cor.	Ant.	Dor.	High	Low	Long
i:					+			+	-	+
i					+			+	-	-
e:					+			-	-	+
a					+			-	+	-
u:							+	+	-	+
u							+	+	-	-
o:							+	-	-	+
ɑ:							+	-	+	+
j	+	+			+			+	-	
w	+	+					+	+	-	
tʃ	-	-	-	+	+	-		+		
dʒ	-	-	+	+	+	-		+		
ʃ	-	+	-	+	+	-		+		
t	-	-	-	-	+			-		
d	-	-	+	-	+			-		
s	-	+	-	+	+	+		-		
z	-	+	+	+	+	+		-		
l	+	-			+			-		
n	+	-			+			-		
k	-	-	-				+	+		
g	-	-	+				+	+		
q	-	-	-				+	-		
χ	-	+	-				+	-		
ʁ	-	+	+				+	-		

## 1.7 Conclusion

In this chapter, the surface inventory of QA is introduced, followed by a discussion of the segments whose classification is surrounded by controversy. Previous analyses of these segments are discussed, and the position adopted in the current study is presented. The UR of [g] and [dʒ] variation is argued to be /g/, not /q/. This position is justified by the history of this segment, affrication in a Bahraini variety, the acoustic characteristic of [q] and its influence on the vowels in its vicinity, and local lexical items in which [g] occurs which have no cognates in CA. In addition, minimal pairs that distinguish between [q] and [g] are presented.

Aside from its alternation with [k], the affricate [tʃ] is argued to be a distinct phoneme in QA. This position is motivated by the existence of local lexical items in which the affricate *invariably* surfaces, in addition to the availability of minimal pairs that show the contrast between these two segments. The chapter ends with the phonological features that are assumed to characterize the segments under discussion.

## 2. AFFRICATION IN ARABIC: A SURVEY

### 2.0 Introduction

The affrication of [k] and [g] to [tʃ] and [dʒ] is a widespread phenomenon. It is exhibited diachronically or synchronically in many languages. The Indo-European language family offers many examples of this process. For example, some Greek and Latin forms that include [k] and [g] developed in modern languages into [tʃ] and [dʒ] when followed by front vowels (Hock, 1991, p. 73-74; 'Anīs, 1992, p. 79-80, 1995, p. 123), as illustrated by English *geography* and *angel*, from Greek *geographo* and *angellos*, or English *regent* from Latin *rego* ('Anīs, 1992, p. 80; Poirier, 1928).<sup>1</sup>

Within Semitic languages, [k] and [g] have undergone affrication in many varieties of Aramaic and Amharic (Bergsträsser, 1983; Jastrow, 1997; Hudson, 1997). In modern South Arabian languages, /g/ turns to [dʒ], in Hoboyōt and in Mehri (Simeone-Senelle, 1997, p. 384). Further, [k] and [g] turn into [tʃ] and [dʒ], respectively, in many varieties of Arabic, as discussed in §2.3.

Cantineau (1936, 1937) described affrication in some of the Bedouin-origin varieties in the Levant and Iraq, plus others in Najd (middle territory of Saudi Arabia). Altoma (1969) briefly discussed affrication in Baghdadi Iraqi. Johnstone (1967; 1978) investigated the phenomenon in some of the dialects of EA -which include QA- and he reported that the same varieties were studied previously by the German Orientalists Wallin (1855), Wetzstein (1868), Socin (1901), and Binder (1939), among others. As indicated by Johnstone (1978), all of these studies agree on the condition under which affrication may apply, that is, in contiguity with front vowels. Within the varieties of EA (or alternatively, the Arabic varieties of the Gulf region), Maṭar investigated affrication in Kuwaiti Arabic (1969) and Bahraini Arabic (1985), but he generalized his findings to include QA and the variety of the UAE. Al-amadidhi (1985) studied the phenomenon in QA, from a sociolinguistic perspective.

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<sup>1</sup> See Calabrese (1991) for Romance languages and Rubach (1984) for Polish, Clements & Hume (1995, p. 295), Watson (2002, p. 33) for Slovak, among many others.



Johnstone reports that the affrication of both <k> and <q><sup>2</sup> is a characteristic of only the Bedouin-origin varieties in the Syro-Mesopotamian region, the EA varieties, the Shammari varieties, and the variety of southern Iraq. In other varieties, one of the processes may occur, but not the other. For example, <q> surfaces as [dʒ] “in a few words in Yemeni”, but <k> never surfaces as [tʃ] in this variety. Similarly, the affrication of <k>, but not of <q>, occurs in some Palestinian and other varieties (Johnstone 1967, p.4-5). Cantineau reports “en Syrie-Palestine des populations sédentaires dont l’ancien kâf est affriqué, mais ces mêmes populations ignorent l’affrication de l’ancien qâf” (1936, p. 112). Martinet (1959, p. 101-102) also mentions that in the Algerian countryside only [k] > [tʃ] is observed, while in north-east Syria, [k] surfaces as [tʃ], but [g] surfaces as [ts].

Below, a number of studies that investigate affrication in Arabic are presented. Some of the issues raised in these studies are discussed, but it is not my goal here to provide a complete analysis of the process in all the varieties in which it occurs. Rather, I focus on works investigating EA varieties, since QA belongs to this group. Before discussing these works, a definition of the Arabic term *tafxi:m* is required, since this word is extensively referred to in most of the works cited below, and it is claimed to interact with affrication (Cantineau, 1936; Maṭar, 1969, 1985).

## 2.1 Tafxî:m and emphasis

*Tafxî:m* is an auditory feature used in the old texts to mean “heaviness or thickness”. This feature is suggested by the old grammarians to characterize a group of segments that include the underlyingly emphatics <t<sup>ʕ</sup>, d<sup>ʕ</sup>, s<sup>ʕ</sup>, ḍ<sup>ʕ</sup>>, the uvulars <q, ɣ, ʁ> and the back variants of the segments that may contextually surface [+back], which are <l, r, a, a:> in CA. According to Ghazeli (1977, p. 7):

“the ‘mufaxxama’ sounds are referred to by most modern scholars collectively as ‘emphatic’. It is, however, important to notice that while the Arab grammarians’ notion of ‘tafxim’ corresponds to an auditory quality, modern description[s] of ‘tafxim’ are rather articulatory. In other words, modern scholars attribute to the ‘mufaxxama’ consonants the articulatory and coarticulatory features that are only observed in the consonants that the Arab

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<sup>2</sup> This orthographic character represents the sound [q] (see §1.3 and §1.5).

grammarians described as ‘mut<sup>ʕ</sup>baqa’.

*Mut<sup>ʕ</sup>baqa* is the term used by the old grammarians for the modern term ‘emphatic’ or ‘pharyngealized’. Segments characterized by this feature have two places of articulation and they retract the place of articulation of other segments in their scope (see Ghazeli, 1977; Bukshaisha, 1985; Zawaydeh, 1999). Identifying *tafxi:m* with emphasis is evident in ’Anis’s (1992, p. 64-66) proposal that the difference between [l] and [r] that are *mufaxxama* and those that are *muraqqqa* ‘softened’ is exactly the same as the difference between [d<sup>ʕ</sup>] and [d], or [t<sup>ʕ</sup>] and [t], indicating that *tafxi:m* equals emphasis.<sup>3</sup>

The class of segments that may contextually surface as *mufaxxama*/emphatic varies in different varieties of Arabic. For example, in the varieties of Palmer, Horan and the Bedouins of the Syro-Mesopotamian desert, Cantineau (1936, p. 12) finds that the labials [b, m, f] and [r] (p. 135) become *mufaxxama* when they occur in the environment of another *mufaxxama*/emphatic consonant, or in the environment of a back vowel (u, o, a, including central a).<sup>4</sup> However, [l] is always *muraqqqa*, in these varieties, except in the environment of the segments that are *mufaxxama* “by nature” (Cantineau, 1936, p. 23). In QA, Bukshaisha (1985) reports that the segments [b, m, f, r, l, n]<sup>5</sup> become emphatic in the scope of emphatic consonants. In addition, she indicates that /l<sup>ʕ</sup>/ occurs in this variety as a distinct phoneme. Johnstone (1967, p. 22) reports the occurrence of emphatic variants of /r/ and /l/ in certain words in the Gulf dialects, without specifying a context. However, Hussain (1985, p. 17) finds that in Gulf Arabic, “when /r/ is adjacent to segments involving posterior articulation such as pharyngeal consonants, uvular consonants, emphatic consonants, and low vowels, it is rendered back [ɾ]”. Further, Hussain considers /l<sup>ʕ</sup>/ a distinct phoneme in GA. Ghazeli (1977) reports the occurrence of a “back” variant of /r/ in North African varieties, as well as in Eastern Arabic varieties. He tentatively suggests that in the Eastern dialects in general, if the vowel following is low or back, then [r] is back, no matter what the

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<sup>3</sup> *Muraqqqa* is a term that has the opposite meaning of *mufaxxama*, and it refers to the ordinary auditory quality of these segments, which can be perceived in contexts other than those that require *tafxi:m*.

<sup>4</sup> It could be concluded that in other contexts, [b, m, f, r] surface *muraqqqa*.

<sup>5</sup> She adds to this class [t]. However, Al-Sulaiti (1993) shows that word initial /t/ assimilates to any following coronal obstruent (including emphatics), and so does word final /t/ that it is followed by a such segment in continuous speech.

preceding vowel is. If the vowel following is palatal, then [r] is front (p. 155). His conclusion, however, is based on items in which /r/ is followed by [i:], not [i]. The emphasis/*tafxi:m* of /a, l, r, n, f, b, m/, however is not as strong as that of the underlyingly emphatic segments, since it affects only adjacent segments (Cantineau, 1936) or only tautosyllabic segments (Ghazeli, 1977, p. 169).

To sum up, the segments /a, l, r, n, f, b, m/ may have two allophones, in certain varieties of Arabic: one is *mufaxxama*, the other, *muraqqqa*.<sup>6</sup>

## 2.2 Cantineau (1936, 1937)

Cantineau investigated a number of Bedouin and Bedouin-origin varieties in the Syro-Mesopotamian region, southern Iraq and Najd. He reports that <q> is realized as [g] in the varieties of the Bedouins (1936, p. 28), and that the velar stops [k] and [g] turn into [tʃ] and [dʒ], respectively, in the context of *muraqqqa* consonants and the front vowels (i, e, a, a:).<sup>7</sup>

- (1) a. tʃalb                      ‘dog’  
       b. dʒadam                ‘foot’

Cantineau also finds that in the varieties of the settled people in Syria and Palestine, <k> affrication is observed, but not that of <q>. In sedentary Iraqi, Cantineau suggests that the words with affricated <q> are borrowed from the varieties of the Bedouins. “En ſirâq, les mots avec un qâf affriqué qu’on peut rencontrer dans des parlers de sédentaires anciens paraissent des emprunts aux parlers des nomades” (Cantineau, 1936, p. 11).

In the context of *mufaxxama* consonants (emphatics) and back vowels, affrication is blocked and the velar stops are kept intact (1936, p. 28, p. 36). Cantineau suggests that since

<sup>6</sup> The term *muraqqqa* is usually used for [a, l, r] not [f, b, m, n].

<sup>7</sup> The definition of and the contexts in which some consonants occur *muraqqqa* are given in section 2.1, above. Cantineau considers items such as [ʕerdʒ] indications that, just like front vowels, *muraqqqa* consonants can trigger affrication. That is, when these consonants ([r] in this example) occur *muraqqqa*, they trigger affrication of the adjacent velar stop (p.37, cf. Johnstone, 1978; Matar 1969, 1985). Also, in some of the Bedouin varieties, [k] and [g] turn into [ts] and [dz] in the same contexts, but since these are not the segments investigated in the current study, they are not discussed here. Cantineau uses [c] for [tʃ], [ǧ] for [dʒ], [k] and [ǧ] for the emphatic versions of [k] and [g], respectively.

[k] and [g] have a “very back place of articulation”, they are *mufaxxama* “by nature” (p. 28).<sup>8</sup> That is, [k] and [g] are always *mufaxxama* except in the contexts triggering affrication, as the examples given in (2) illustrate.<sup>9</sup>

- |     |             |                  |
|-----|-------------|------------------|
| (2) | a. na:ḡā    | ‘a female camel’ |
|     | b. kḡfu:f   | ‘palms’          |
|     | c. kḡu:b    | ‘heels’          |
|     | d. ḡārḡu:rā | ‘a big sheep’    |

However, most of Cantineau’s examples in which [k] and [g] are claimed to surface *mufaxxama* involve a context in which the velar segment is adjacent to either central or back low vowels as in (2a) (2d), or pharyngeal segments, as in (2c). Interestingly, low vowels are suggested to induce backing in adjacent consonants (Ghazeli, 1977), and the *tafxi:m* of [k] in (2c) could be attributed to coarticulation with the adjacent pharyngeal consonant, since pharyngeal consonants are characterized by a constriction in the pharyngeal cavity that is very close to the secondary point of articulation of the emphatic/*mufaxxama* segments (McCarthy, 1994). In other cases, the velar segment occurs adjacent to another *mufaxxama* segment as in (2b), in which [k] is adjacent to [f] which surfaces *mufaxxama* when adjacent to back vowels, according to Cantineau’s own observation (see above, §2.1 and Cantineau, 1936, p. 12 & 23, 1937, p. 135). Therefore, the *tafxi:m* in this item is a property of [f], not of [k].

Therefore, it is more likely that the *tafxi:m* (or the back articulation) of the velar segments in these and similar items is due to the coarticulation effect of the adjacent back vowels and consonants and other *mufaxxama* segments in these words, not to the nature of the velar segments per se.<sup>10</sup> Cantineau observes variation among the investigated varieties in

<sup>8</sup> See Johnstone’s (1978) criticism of considering [k] and [g] *mufaxxama* by nature.

<sup>9</sup> Cantineau distinguishes between three low vowels in these varieties; front [a], represented here by [a], a central [a], represented here by [ā], and a back [a], represented here by [ɑ].

<sup>10</sup> Based on an acoustic study, Flemming (1995) finds that the velar stops [k] and [g] do not induce backing or fronting, and they are vulnerable to the influence of adjacent segments.

the vicinity of the front vowel [a], in which case affrication occurs in some varieties, but not in others (p. 37).

(3)		Tribe
	a. tʃatab	‘to write’ (Hadidin)
	b. katab	‘to write’ (Amour)

He also notes that affrication may occur adjacent to back vowels in plural forms whose singular bases meet the condition of affrication, and undergo the process, as demonstrated in (4). However, this occurs only among the settled people (sedentary), whose varieties exhibit only [k] affrication, while Bedouins tend to keep the “phonetic opposition” (1936, p. 39).

(4)	Singular	Plural (sedentary)	Plural (Bedouins)	
	a. di:tʃ	dju:tʃ	dju:k <sup>ʃ</sup>	‘cock’
	b. tʃaff	tʃfu:f	k <sup>ʃ</sup> fu:f	‘palm’

Generally, Cantineau assumes that the CA cognates of the dialectal forms are the input of these forms. But when the CA cognates do not follow his predictions, that is, when CA forms have vowel patterns that do not trigger affrication, while the local forms undergo the process, Cantineau suggests that these are derived from old forms that have vowel patterns different from those found in the CA forms. The following items illustrate this reasoning:

(5)	Local	CA	Old forms	
	a. tʃelwa	kulwat	*kilwat	‘kidney’
	b. dʒedda:m	qudda:m	*qidda:m	‘front’

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### 2.3 Johnstone (1967)<sup>11</sup>

Johnstone investigated the varieties of Kuwait, Bahrain, Qatar, Abu Dhabi, Dubai and Buraimi, which are most of the varieties of EA. Generally, the affrication of <k> and <q> is permitted in the vicinity of front vowels (Johnstone, 1967, p. 2), as shown in (6).

- |     |            |           |                     |
|-----|------------|-----------|---------------------|
| (6) | a. fatʃtʃ  | ‘to open’ | (Kuwait, Abu Dhabi) |
|     | b. saːjɪdʒ | ‘driver’  | (Buraimi)           |

Johnstone’s examples indicate that affrication also occurs in items in which the trigger of the process (that is, the front vowel) is separated from the velar stops [k] and [g] by another segment, as shown in (7).<sup>12</sup>

- |     |                        |               |             |
|-----|------------------------|---------------|-------------|
| (7) | a. ʰaldʒ               | ‘mouth’       | (Kuwait)    |
|     | b. ʕirdʒ               | ‘vein’        | (Kuwait)    |
|     | c. ʕiltʃ               | ‘chewing gum’ | (Kuwait)    |
|     | d. ʕaðdʒ <sup>13</sup> | ‘date-raceme’ | (Abu Dhabi) |

The affricate [tʃ] also occurs in borrowings from other languages, though a number of these are sometimes “corrected” to [k], as the following examples show:

- |     |           |   |       |              |              |
|-----|-----------|---|-------|--------------|--------------|
| (8) | a. tʃarχ  | > | karχ  | ‘wheel’      | (from Farsi) |
|     | b. tʃaʃma | > | kaʃma | ‘spectacles’ | (from Urdu)  |

In both of these examples the affricate occurs adjacent to a front vowel, therefore it is treated

<sup>11</sup> Johnstone uses [č] for [tʃ], [ḳ] for [χ], [š] for [ʃ], [a] for [a], and [aa] for [a:]. He indicates that the last vowel is a retracted central vowel that is not easily distinguished from [a:] (p. 23). Johnstone reports that in Qatar, Buraimi, and Abu Dhabi the affricate [dʒ] is usually realized as a palatal stop, that is, [j]. However, for the sake of uniformity, in what follows, this distinction is ignored.

<sup>12</sup> According to my own observations, these items occur in the varieties of Bahrain, Abu Dhabi and Qatar as well.

<sup>13</sup> An informant from Abu Dhabi indicated to me that this word surfaces as [ʕiðdʒ], in this variety.

as an output of [k] affrication in native items. It is also possible that the affricate in (8b) is turned to [k] to avoid a violation of OCP (see, below, 3.7). However, in other borrowings, [tʃ] is kept intact:

- (9) a. tʃuːla                      ‘stove’  
       b. tʃajjak                  ‘to check’

Since in (9a) [tʃ] occurs adjacent to a back vowel, it is not expected to be treated as a case of affrication. Hence, it does not exhibit alternation. However, in (9b) the affricate occurs in a context triggering affrication, but since this item comes from English, a language with which contact has been established relatively recently, it is not treated like the items in (8) above.

In addition to occurring with different kinds of vowels in borrowings, in the variety of Abu Dhabi,<sup>14</sup> [tʃ] occurs with back vowels in native items. These items are discussed in Johnstone (1978) as well as in the following section.

- (10) a. tʃoːtʃab                  ‘undersea fresh water spring’  
       b. tʃoːs<sup>1</sup>                    ‘a small shell’  
       c. maztʃuːm                ‘having a cold’  
       d. ʃoːtʃ                      ‘thorns; scorpion stings’

Although the environment triggering affrication is reported to be identical in all these varieties, Johnstone’s data indicate that there are lexical items that undergo affrication only in one variety, or in some varieties but not in others. The following items illustrate this situation.

- (11) a. (i). kilma                  ‘word’                      (Kuwait, Qatar)  
       (ii). tʃalma                  ‘word’                      (Buraimi)

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<sup>14</sup> In this variety, [tʃ] surfaces sporadically as a reflex of SA [q] (Johnstone, 1967).

b. (i).	mitʃɑ:n	‘place’	(Qatari, Buraimi)
	(ii).	makɑ:n	‘place’ (Bahrain, Kuwait)
c. (i).	ʃɑrɡi:	‘eastern’	(Bahrain)
	(ii).	ʃɑrdʒi	‘eastern’ (Kuwait, Dubai)
d. (i).	ɡili:l	‘a little’	(Bahrain)
	(ii).	dʒili:l	‘a little’ (Kuwait)
e. (i).	digi:ga	‘minute’	(Kuwait)
	(ii).	didʒi:dʒa	‘minute’ (Dubai)

On the other hand, Johnstone’s data also indicate that there are lexical items that undergo the process in most of these varieties (12).

(12)	a.	ba:tʃir	‘tomorrow’	(Kuwait, Bahrain, Qatar)
	b.	tʃam	‘how much’	(Kuwait, Bahrain, Qatar)
	c.	simatʃ	‘fish’	(Kuwait, Bahrain, Dubai)
	d.	sitʃtʃi:n	‘knife’	(Kuwait, Bahrain, Buraimi)

However, it should be pointed out that the nonoccurrence of a form in a certain variety in Johnstone’s data should not be taken as an indication that this form is ruled out in that variety. Most of his data were extracted from unguided interviews, in which the attestation of a form depends, to a great extent, on the topics discussed in each interview.<sup>15</sup> Based on my own knowledge of most of these varieties, I could report that (12a), for example, occurs also in the varieties of Dubai and Abu Dhabi, and (12d) occurs in the varieties of Qatar, Abu Dhabi and Dubai, though these forms were not found in Johnstone’s data from these varieties.

Another factor that has an influence on whether a form is attested or not is the

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<sup>15</sup> The data were transcribed from recordings of spontaneous speech, except for some of the Kuwaiti items, which may have been extracted from prepared speech (Johnstone, 1967, p. 174).



interviewees themselves, who, instead of using the variants that they would usually use in their everyday language, might use more standard or less local forms, especially with a stranger. Indeed, Johnstone says: “there are very few speakers who do not have some idea of ‘correct’ Arabic (viz. of the pan-Arabic *koiné*), and this interferes with, and to some extent obscures, certain features of their dialects for the investigator” (p. xxvii). He adds: “young Kuwaitis already found it difficult and even embarrassing to speak ‘pure’ Kuwaiti at the time of my visit” (p. xxviii).

In addition, with respect to the affrication of the voiced velar stop [g], Johnstone’s data from Bahraini Arabic should be dealt with quite tentatively. Maṭar (1985) finds that in Bahrain, there are two distinct varieties, and [g] affrication occurs only in one of them (p. 144). Therefore, it is very likely that at least one of Johnstone’s three Bahraini informants spoke the variety not exhibiting affrication. This could be the reason for the nonaffrication of [g] in some of the Bahraini data in (11) above, and below in (17).

Johnstone reports that when the affricate occurs in a singular form “there is a tendency to retain it in the plural even in the contiguity of a back vowel” (p. 30). That is, even when adjacent to back vowels, [k] and [g] in some plural forms undergo affrication by virtue of meeting the condition of affrication in their singular forms:<sup>16</sup>

(13)	Singular	Plural		
	a. di:tʃ	dju:tʃ	‘cock’	(Kuwait)
	b. ʕiltʃ	ʕilu:tʃ	‘chewing-gum’	(Kuwait)
	c. ʔaldʒ	ʔilu:dʒ	‘mouth’	(Kuwait)
	d. rifi:dʒ	rifdʒa:n	‘companion’	(Kuwait)
	e. ʔaðdʒ	ʔuðu:dʒ	‘date-raceme’	(Abu Dhabi)

However, this is not always the case, since in other plural forms, the affrication of [k] and

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<sup>16</sup> In the current study, these forms are considered to be doublets. See §3.7, below.

[g] is blocked, although it applies in their singular forms, in which the condition for undergoing the process is met, as illustrated in (14).

(14)	Singular	Plural		
	a. ʕirdʒ	ʕiru:g	‘vein’	(Kuwait)
	b. ri:dʒ	riju:g	‘spittle, pl. breakfast’	(Kuwaiti)
	c. dʒirba	girab	‘water skin’	(Abu Dhabi)
	d. hidʒdʒ	hga:ga	‘young camel’	(Abu Dhabi)
	e. lidʒi:	lga:ja	‘4-year old camel’	(Abu Dhabi)

In the plural form in (14c), [g] seems to occur in a context triggering affrication; however, it does not undergo the process. A possible reason for the lack of affrication in this form could be that [r] surfaces emphatic/*mufaxxama* (see section 2.1 above), and retracts the point of articulation of the vowel preceding it, which surfaces as [i] and therefore does not trigger affrication. Furthermore, the singular forms cited below occur invariably with [g], but their plural forms undergo affrication, since only in these is the condition for undergoing the process met, according to Johnstone.

(15)	Singular	Plural		
	a. gubguba	dʒaba:dʒi:b	‘crab’	(Abu Dhabi)
	b. sa:ru:g	sara:wi:dʒ	‘sand corridor’	(Abu Dhabi)
	c. gʕu:d	dʒʕa:di:n	‘mature male camel’	(Abu Dhabi)
	d. ʕargu:b	ʕara:dʒi:b	‘sand dune’	(Buraimi)
	e. go:m	dʒi:ma:n	‘raiding party’	(Buraimi)

Johnstone finds that there are exceptions to the process of [k] affrication, such that although the condition for undergoing the process is met, the process does not apply. He cites the following items from the Kuwaiti (K) and Bahraini (B) varieties:

(16) <sup>17</sup>	a. j-ba:rik	‘to bless’	(K)	b. ʔaki:d	‘certain’	(K)
	c. ḥakam, ja-ḥkim	‘to rule’	(K)	d. killiʃ	‘quite’	(K)
	e. kallaf	‘to cost’	(K, B)	f. kilma	‘word’	(K)
	g. s <sup>ʕ</sup> akk, j-s <sup>ʕ</sup> ikk	‘to close’	(K)	h. kirsi	‘chair’	(K)
	i. kisar, ja-ksir	‘to break’	(K)	j. wiki:l	‘agent’	(K)
	k. misak, ja-msik	‘to grasp’	(K)	l. maka:n	‘place’	(K, B)
	m. sikan, ja-skin	‘to live (in)’	(K)	n. ʃikil	‘like’	(K, B)
	o. ʃakk, j-ʃikk	‘to doubt’	(K)	p. la:kin	‘but’	(B)
	q. sikat, ja-skit	‘to keep quiet’	(B)	r. fikra	‘idea’	(B)
	s. kadd, i-kidd	‘to toil; earn’	(B)	t. hina:k	‘there’	(B)
	u. kaddar, i-kaddir	‘to sadden’	(B)	v. kill, kull	‘all’	(B)
	w. kital, ja-ktil	‘to beat’	(B)	x. sa:kin	‘living (at)’	(B)
	y. miski:n, msa:ki:n	‘poor person’	(B)	z. ḥaki:m	‘doctor’	(B)

Note that about half of the reported exceptions to the process of [k] affrication in these two varieties consist of verbs. In other items, that is, (16l), (16p), (16t) and (16x), [k] occurs adjacent to [a:], for which a back articulation is noticed by Johnstone, among Bahraini speakers. He says that “there is a tendency for aa to be fully back even in contiguity with non-emphatic consonants”, which he assumes to be due to a “Persian influence” (p. 35). Johnstone considers this tendency responsible for the nonaffrication of the first [k] in [ska:tʃi:n] ‘knives’, and I suggest that it could also be responsible for the nonaffrication in (16l), (16p), (16t) and (16x). Furthermore, Johnstone reports that “in Kuwaiti, some educated speakers have a fully front aa” (p. 32). The situation seems to be similar in Bahraini Arabic. He says: “in the speech of some people, perhaps only educated people, aa in the contiguity of nonemphatic consonants may be [a:] or even [æ:]” (p. 35). This means that other educated speakers (in the case of Kuwaiti) and uneducated speakers (in the case of both Kuwaiti and Bahraini) have either a central, or even a sort of back long

<sup>17</sup> Most of the verbs are given in both the perfective and imperfective tenses. Johnstone (1967) also indicates that (16v) surfaces as in the villages of Bahrain.

low vowel, that is [ɑ:]. This is important because some of the exceptions to affrication could be analyzed as involving cases in which a non-front [ɑ:] is adjacent to the velar stop in question.

As in the case of the exception to [k] affrication, almost half of the exceptions to the process of [g] affrication in the Kuwaiti and Bahraini varieties belong to the category of verbs. The category of the lexical item is found to be relevant as to whether or not affrication applies in QA (this issue is discussed in §3.4.3). However, more investigation is needed before reaching any conclusions concerning other varieties.

(17)	a. dagg, j-digg	‘to knock’	(K)	b. digi:ga, diga:jig	‘minute’	(K)
	c. ḥadag, ja-ḥdig	‘to fish’	(K)	d. gisim, ḡagsa:m	‘part’	(K)
	e. fa:rag, i-fa:rig	‘to separate’	(B)	f. ḥagg	‘for, to’	(K)
	g. gaʕad, i-gʕad	‘to sit’	(B)	h. digal	‘mast’	(K)
	i. ga:ʕid	‘sitting’	(B)	j. gadd	‘amount’	(B)
	k.nahag, i-nhag	‘to bray’	(B)	l. gili:l	‘a little’	(B)
	m. ḥagi:ga	‘truth’	(B)	n. sʕidi:g	‘friend’	(B)
	o. ʕargi	‘eastern’	(B)			

Although (17l) and (17n) do not undergo affrication in Johnstone’s data, they do in Maṭar’s (1985, p. 147). It is important to note that in Bahrain, there are two varieties, both of which exhibit the affrication of [k], but only one of which permits the affrication of [g] (Maṭar, 1985). Therefore, it is possible that the Bahraini items (17l) and (17n) resist affrication because the affrication of [g] is not exhibited in the varieties of some of Johnstone’s informants.<sup>18</sup> Further, according to Maṭar (1985), in Bahrain, the item [kital] (16w) is a characteristic of the variety, in which [g] affrication is inhibited. Therefore, the

<sup>18</sup> In addition, the artifacts of the interviews may have had an effect on the word choice of the interviewees (as indicated above); however, the influence of this factor is not confined to the interviews held in this variety. See also Al-amadidhi (1985, p. 55) about this issue.

occurrence of this verb in Johnstone's data indicates that at least one of his informants was a speaker of a variety that does not exhibit [g] affrication. Hence, the forms that Johnstone considers exceptions to [g] affrication in Bahraini Arabic (17) should be considered so only tentatively, since at least some of them, if not all, come from a speaker whose variety does not exhibit the process. This supports my previous note about the Bahraini data that Johnstone reports to resist affrication in (11) above.

Johnstone points to the variable nature of affrication, though only for the Kuwaiti and Bahraini varieties. He says: "it should perhaps be remarked that a Kuwaiti speaker may well use words like ba:gi and ba:dʒi, or kam and tʃam (for example) in the same breath" (p. 32). In the case of Bahraini, he reports that the variants [tʃ] and [dʒ] occur less frequently "in the speech of educated speakers" (p. 33), which means that the process is variable here too. Johnstone suggests that partially because of the "spread of education", the affricated variants "have disappeared from the dialect" of Kuwait, except in lexical items that are specific to the variety, or in items that differ semantically from their SA cognates. The other factor that he mentions as negatively affecting the occurrence of this process is the continuous increase in the number of non-Kuwaitis in this society (p. 29-30). That is, the constant contact with other varieties of Arabic, in which affrication does not occur, decreases the occurrence of the process in the speech of Kuwaitis. So, among the examples that he cites for the occurrence of affrication, Johnstone includes forms that "would now generally have *k* in place of *tʃ*" (p. 30).

With respect to the variety of Qatar, Johnstone's account of QA should not be taken as a reliable source of information about this variety, or more precisely, about the variety spoken in Doha. That is because some of the characteristics that he claims to be applicable to this variety are not quite so. For instance, Johnstone reports that the first person plural pronoun in QA is [(i)hinna], which is actually not the case in Doha. In fact, in QA, the form used for this pronoun is [ihna] (see also Al-Sulaiti, 1993, p. 29). I attribute this discrepancy to the fact that neither of Johnstone's two informants spoke the variety of Doha. That is, although one of these two Qatari informants actually lived in Doha "his culture was not entirely of the town", and as admitted by the author himself: "his father spoke a Shammari

dialect and it is possible that traces of this appear in his speech”. Indeed, I found some atypical features in the speech of this informant (Johnstone, 1967, p. 218-220), comparing to that of QA. For example, ‘he killed’ occurs in the speech of this informant as [kitəl] (p. 218), for which the QA equivalent is only [ðibəh]. It is worth mentioning that, in addition to other aspects of the grammar, there is dialectal variation with respect to which lexical items undergo affrication even within the EA group (as indicated in the previous section), not to speak of the Shammari variety, which constitutes a different branch of North Arabic varieties (Johnstone 1967, p.1-2, and above, §1.1).

Furthermore, Johnstone notes that the affrication of [k] and [g] occurs less frequently in the speech of his Qatari informants than in the speech of the town dwellers (including the dwellers of Doha) and the inhabitants of the north of the country (p. 36). Thus, it can safely be suggested that these data are not representative of the variety spoken in Doha at that time (1958-1959), not to speak of the current time. However, for the sake of completeness Johnstone’s data from QA are given below.

(18) Items undergoing affrication in QA

a. birtʃa	‘cistern’	b. tʃibi:r	‘big’
c. tʃam	‘how much’	d. tʃi:s	‘bag, purse’
e. fidʒaʃ	‘truffles’	f. dʒalʃa	‘fort’
g. dʒidda:m	‘in front of’	h. dʒirn	‘hill’
i. mara:dʒid	‘sleeping spots’	j. nidʒja:n	‘dunes’

It should be noted that the word for ‘truffles’ in (18e) occurs invariably as [fagiʃ] in QA. Also, (18f) occurs as [dʒlaʃa] or as [qalʃa], the latter being the variant used only by educated speakers, and (18i) seems to be an old form that is not currently used.

(19) Exceptions

a. wika:d	‘surely, definitely’	b. kala:m	‘speech’
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c. kilma	‘word’	d. rigga	‘a level plain’
e. ʔre:g	‘small dunes’	f. ʔigg	‘young camel’
g. ne:ga	‘red dust’		

The pages concerning affrication in Johnstone (1967) are essentially a citation of data that was collected from the relevant varieties. A true analysis of the data is missing in this work; however, it is provided in Johnstone (1978), which is the topic of the following section.

## 2.4 Johnstone (1978)

This article, insightfully, attempts to analyze the process of affrication in the same varieties investigated in Johnstone (1967). The analyses presented here are based on the data collected in 1958-1959 (Johnstone, 1967), plus additional data extracted from a Kuwaiti dictionary. Data representing the ‘Anayzī variety of central Najd are also included. With respect to QA, Johnstone’s analysis should not be taken as applying to this variety, in every detail, as indicated in the previous section. In addition, the author admits that his data and comments do not cover the varieties of the town dwellers in Qatar, and that they only reflect the speech of “the ʃaha:wi:n section of the Bani Ha:dʒir”<sup>19</sup> (p. 289). Johnstone distinguishes between two types of varieties in the region that he investigates. In the first, [k] and [g], in contiguity with front vowels, turn into [ts] and [dz], which is a characteristic of the varieties of central Najd. Towards the north and east of this area, namely, in the varieties of the Persian Gulf countries, in the same context, the outputs of the process are [tʃ] and [dʒ] (p. 285).

Johnstone (1978) suggests that in the *Hadhari* dialects, that is, the dialects of the town dwellers in Kuwait, Bahrain, Qatar, Abu Dhabi, Dubai and Buraimi, the affrication of both [k] and [g] occurs ‘regularly’ when adjacent to the vowels [i, i:, e:]. However, Johnstone finds variation among these dialects when the velar stops are adjacent to [a] or [a:], (p. 290-291). He relates variation in the context of the long vowel [a:] to his observation

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<sup>19</sup> One of the Qatari tribes.

that this vowel does not always surface as a front vowel. He says: “the long ‘front’ a is not equivalent in quality to the short a and is often difficult to distinguish from ‘back’ a in most of the dialects studied by me” (p. 291). With respect to the short [a], he says “in different dialects the a may be front or back depending on whether the affricates occur in any given form or not” (p. 291). That is, if affrication occurs in a form in the context of [a], this vowel would be pronounced as a front vowel. If, on the other hand, the form does not undergo affrication, [a] would not be pronounced as such. So, it is not obvious whether the vowel is affecting the velar segments and triggering their affrication, or whether the velar segments [k] and [g] are retracting the place of articulation of the vowel, or even whether the affricates are fronting the vowels! Nevertheless, Johnstone summarizes his findings with respect to the vowel [a]/[a:] as follows:

1. When adjacent to emphatic consonants, this vowel is always a back vowel.
2. When adjacent to the labials [b, f, m, w] and the velar stop [g], this vowel “may or may not be a back vowel depending on phonological context”.
3. When adjacent to [r] or [l], this vowel “may or may not be a back vowel depending on phonological context” (p. 292).

The phonological context referred to is not specified.<sup>20</sup>

When affrication applies in contexts in which the velar stop is not in the immediate contiguity of a front vowel, such as those cited below in (41), Johnstone considers the trigger of affrication to be a front vowel, although it is separated from its target by one of the consonants [r, l, n, ð]. Here, he differs from Cantineau, who considers the *muraqqqa* consonants to be the trigger of affrication in these examples (see, Cantineau, 1936, p. 37, and above, §2.1). These items, according to Johnstone, demonstrate the occurrence of affrication “not in the immediate contiguity of the front vowel with a nonemphatic consonant intervening” (p. 290). He characterizes these segments as being ‘nonemphatic’ because [r] and [l], which are the intervening segments in most of these items, may surface emphatic in certain contexts (see above, §2.1).

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<sup>20</sup> In his (1967) study, Johnstone indicates that the liquids [r] and [l], are “emphatic” consonants, “in certain words”, but he does not provide a certain environment for their occurrence as such. He provides these examples: [rakba] ‘the beginning of the pearling season’, [ra:h] ‘he went’, and [al<sup>h</sup>l<sup>h</sup>a:h] ‘God’ (p. 22).



- (20) a. ʕirdʒ                      ‘vein’                                      b. ʕaldʒ                      ‘mouth’  
       c. wirtʃ                      ‘upper part of thigh’                      d. hintʃ                      ‘chin’  
       e. ʕiltʃ                      ‘chewing gum’

As indicated previously by Cantineau (1936), Johnstone finds that in the Hadhari ‘sedentary’ varieties in which the outputs of [k] and [g] affrication are [tʃ] and [dʒ] respectively, certain plural forms undergo affrication when adjacent to back vowels, by virtue of having singular forms in which the condition of affrication is met. This is “tentatively suggested” to be “due to the obsolescence of the tendency for such affricates to occur, and because of this the principles underlying the process have become obscured” (p. 293). Therefore, he suggests that the affricates in these cases are considered to represent the phonemes /tʃ/ and /dʒ/, rather than being the affricate allophones of the velar stops [k] and [g], respectively. However, Johnstone claims that this usually occurs “only in words for which there is no obvious literary equivalent, for example, ʕalg ‘mouth’ < ‘throat’ ʕalq” (p. 293).

- (21) Singular                      Plural
- |          |         |               |             |
|----------|---------|---------------|-------------|
| a. di:tʃ | dju:tʃ  | ‘cock’        | (Kuwait)    |
| b. ʕiltʃ | ʕilu:tʃ | ‘chewing gum’ | (Kuwait)    |
| c. ʕaldʒ | ʕilu:dʒ | ‘mouth’       | (Kuwait)    |
| d. ʕaɖdʒ | ʕuɖu:dʒ | ‘date raceme’ | (Abu Dhabi) |

But upon close examination of the data, it appears that three of the four examples, (21a-b) and (21d), actually have literary forms that are equivalent in their meanings to the dialectal forms. The literary forms of these items are [di:k] [ʕilk] and [ʕiɖq/ʕaɖq], respectively.

Johnstone finds that in Abu Dhabi (AD), the affricate [tʃ] occurs adjacent to back vowels. He assumes the occurrence of this affricate in Persian borrowings to be partially responsible for obscuring the context in which affrication is permitted. Another factor that

he considers to be at work is the need to distinguish items that are etymologically, but not semantically, related (p. 294), which are given below in (22). He says: “it is also possible here that in some of these words a tendency is operating to distinguish words by the use of these variants” (p. 293-294). This may be taken as an indication that the affricate [tʃ] is used in the variety of Abu Dhabi as a distinct phoneme (p. 293-294).

- |      |             |                   |      |           |                  |      |
|------|-------------|-------------------|------|-----------|------------------|------|
| (22) | a. tʃo:tʃab | ‘undersea spring’ | (AD) | b. ko:kab | ‘a planet, star’ | (AD) |
|      | c. ʃo:tʃ    | ‘thorns’          | (AD) | d. ʃo:ka  | ‘a fork’         | (AD) |
|      | e. dʒa:s    | ‘to touch’        | (K)  | f. ga:s   | ‘to measure’     | (K)  |
|      | g. tʃfu:f   | ‘gloves’          | (K)  | h. kfu:f  | ‘palms’          | (K)  |

Johnstone provides exceptions to the process of affrication, which are almost identical to those cited in Johnstone (1967) and above (§2.3). However, he notes that among these exceptions are words in which the velar stops occur as final geminates [-kk] and [-gg] (1978, p. 292).

- |      |         |              |                  |            |
|------|---------|--------------|------------------|------------|
| (23) | a. ʃakk | ‘to doubt’   | b. dagg, ji-digg | ‘to knock’ |
|      | c. ʃagg | ‘right’      | d. ʃagg, ji-ʃigg | ‘to tear’  |
|      | e. bagg | ‘mosquitoes’ |                  |            |

Johnstone (1978, p. 292) also suggests that [k] and [g] do not undergo affrication when they occur as the first element of a two consonant cluster -word initially or medially- that is followed by a *mufaxxama* syllable or a back vowel. He cites examples of this case from ‘Anayzi, which is a Bedouin variety from central Najd, in which the affricate counterparts of [k] and [g] are [ts] and [dz]. Some of these examples are given below where the syllables following the velar stops in (24a, c, d) are assumed to be *mufaxxama*:

- |      |            |            |           |            |
|------|------------|------------|-----------|------------|
| (24) | a. ja-krah | ‘he hates’ | b. tsirih | ‘he hated’ |
|------|------------|------------|-----------|------------|

c. ja-gdar	‘he can’	d. dzidar	‘he could’
e. kba:r	‘big (pl.)’	f. tsibi:r	‘big’

It should be noted that this generalization is not necessarily applicable to EA varieties, since, in these varieties, neither the imperfect forms in (24a, c) nor the perfect forms of these examples undergo affrication. In addition, there seems to be no need to require that the velar segment occur in such a cluster, since in any case, if the velar segment is followed by a back vowel, it is also expected not to undergo affrication. Similarly, if the velar segment is followed by a *mufaxxama* syllable, such as in the items cited in (24), as claimed by Johnstone, it will resist affrication. Therefore, the fact that in these examples [k] and [g] occur in a two-consonant cluster seems to be irrelevant. From the same ‘Anayzī variety, Johnstone cites the word [tsla:] ‘kidneys’ as a counterexample to his generalization, and the existence of more counterexamples is indicated (p. 292).

Although Johnstone’s (1978) study surpasses the other relevant studies, and includes valuable suggestions, it lacks a full and coherent analysis of affrication, partly because of the limitations of the theoretical tools at his disposal, and partly due to the fact that he does not limit his analysis to a specific variety.

## 2.5 Altoma (1969)

Altoma reports that both [g] and [k] are “replaced by” [tʃ] and [dʒ] in Iraqi Arabic (IA), as represented by the dialect of Baghdad. However, he only specifies the context triggering the process for [k], which is being in contiguity with front vowels (p. 13),<sup>21</sup> as shown in (25).

(25) a. ha:jitʃ	‘tailor’
b. tʃalb	‘dog’
c. dʒidda:m	‘front (of)’

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<sup>21</sup> The fact that the environment for [g] affrication is not specified for this variety could be related to Cantineau’s comments that the words with affricated [g] in IA are borrowed from the varieties of the Bedouins (1936, p. 112; Kaye & Rosenhouse, 1997).

Altoma reports the existence of exceptions to the process of [k] affrication, which he partially attributes to Classicism, that is, the influence of CA. The examples that he provides are:

- (26) a. sa:kit                      ‘silent’  
       b. kisar                      ‘to break’  
       c. ʔakil                      ‘eating, food’

He also includes examples for the occurrence of [k] affrication adjacent to back vowels (p. 13):

- (27) a. dju:tʃ                      ‘cocks’  
       b. ftʃu:tʃ                      ‘jaws’  
       c. tʃuwa                      ‘to burn’

The first two of these items (27a-b) are the plural forms of items that are predicted to undergo affrication. The singular forms are [di:tʃ] and [fatʃtʃ] (p. 13). Similar items are discussed in Cantineau (1936) (see §2.3) and in Johnstone (1978) (see §2.4). In short, these items may have been reanalyzed with an underlying affricate. The affricate in (27c) could equally be suggested to belong to the phoneme /tʃ/, since this phoneme exists in this variety, as admitted by the author himself.

## 2.6 Maṭar (1969)

According to Maṭar, in Kuwaiti Arabic, the affrication of [k] and [g] applies when preceded or followed by a front vowel [i, i:, a, a:] that is not *mufaxxama*.<sup>22</sup>

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<sup>22</sup> The vowel system of this variety includes the front long vowel [e:], but since Maṭar requires the triggering environment for affrication to occur in the SA cognates of the Kuwaiti forms, and since [e:] does not belong to the vowel inventory of SA, he ignores this vowel. It is worth mentioning that this treatment is not confined to affrication. Maṭar considers SA to be the UR or the lexical representation of the local varieties of Arabic, in general. Maṭar uses *mufaxxama* to mean both retracted and emphatic.

- (28) a. j-ba:ritʃ 'he blesses'      b. mba:rak 'blessed'  
       c. ba:tʃir 'tomorrow'      d. bakkar 'he was early'  
       e. tʃibi:r 'big'      f. kba:r 'big (pl.)'
- (29) a. mre:dʒa<sup>23</sup> 'curry (dim.)'      b. marag 'curry sauce'  
       c. ba:jidʒ 'have stolen'      d. ba:g 'he stole'  
       e. ri:dʒ 'saliva'      f. ji-trajjag 'he has breakfast'

In (28b), (28d), (28f), (29b) and (29d) affrication does not apply, according to Maṭar, because of *tafxi:m*/emphasis, but it is not clear whether he is referring to the *tafxi:m*/emphasis of one of the contextually emphatic consonants [b, r, m] or to the vowel [a]. He suggests that in (29f) [r] surfaces *mufaxxama* (p. 27). In fact, even if [r] surfaces emphatic in this item, its effect should not exceed adjacent segments, since the effect of the contextually emphatics is restricted to adjacent segments (Cantineau, 1936) or tautosyllabic segments (Ghazeli, 1977).

In addition, [g] may undergo affrication when preceded or followed by a front vowel with an intervening consonant (p. 26), which is usually [r] or [l], as demonstrated in (30).

- (30) a. ʕirdʒ 'vein'  
       b. ḥaldʒ 'mouth'

Maṭar sometimes refers to the vocalic patterns of the CA cognates of the Kuwaiti forms as determining whether affrication applies or not, as illustrated by the following examples:

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<sup>23</sup> The trigger of affrication in (29a), from Matar's point of view, is the glide <j> that precedes SA [q] in [murajqa] (p. 27).

(31)	Kuwaiti	CA	
	a. dikka:n	dukka:n	‘shop’
	b. sikka:n	sukka:n	‘steering wheel’
	c. kill	kull	‘all’
	d. killiʃ	?	‘not at all’

Maṭar suggests that these items do not undergo affrication because the condition of affrication is not met in their CA cognates. That is, in the CA forms [k] occurs adjacent to [u], which is expected to block affrication. This could be a possible solution for (31a-c), but perhaps not for (31d). This word does not have a counterpart in SA. It could be argued that it is historically derived from [kull] (killiʃ < kill < kull ‘all’), and that the Arabic Koine negative marker [-iʃ], which occurs in many modern varieties of Arabic, is added to it. In this case, the reasoning used to justify the nonapplication of affrication in (31) would apply to this item as well. However, Maṭar provides other items which indicate that even if the condition of affrication is met in the CA cognates, the process does not apply, as in (32b) and (32d).

(32)	Kuwaiti	CA	
	a. kil	kul	‘eat!’
	b. kal	ʔakal(a)	‘he ate’
	c. ʔiskit	ʔuskut	‘shut up!’
	d. sikat	sakat(a)	‘he silenced’

Maṭar claims that affrication in the Kuwaiti imperative verbs in (32a) and (32c) does not apply because the forms occur in CA as [kul] and [ʔuskut], respectively (p. 40). However, if we consider the perfective forms of these verbs, which occur as [kal] and [sikat], respectively, in Kuwaiti (see also, Johnstone, 1978, p. 292), and as [ʔakala] and [sakata] in CA, it appears that the CA cognates of local varieties are irrelevant as to whether or not affrication applies. That is, if the factor determining whether affrication applies to a certain

form is the availability of the context triggering the process in the CA cognate, then the Kuwaiti verbs [kal] and [sikat] should undergo the process, because the context triggering [k] affrication is available in their CA cognates. But the Kuwaiti forms, in fact, never undergo affrication. Furthermore, if the context of affrication needs to be met in the CA cognates of the Kuwaiti forms, then, [kba:r] (28f) should exhibit affrication because the form occurs in CA as [kiba:r]. Affrication never applies to [kba:r], a fact that Maṭar attributes to *tafxi:m*, which is exhibited in the Kuwaiti, but not the CA, form. A discussion of a similar case can be found in §1.3.2.1, which deals with [g] affrication in a Bahraini variety.

Maṭar refers to *tafxi:m*/emphasis as the blocker of affrication in [gab<sup>ʕ</sup>ul<sup>ʕ</sup>] ‘before’, and the verbs [ð<sup>ʕ</sup>ɑ:g] ‘became tight’, [s<sup>ʕ</sup>idag] and [ji-s<sup>ʕ</sup>dig], which are the perfect and imperfect forms of ‘to speak the truth’. However, he does not explain why the affricate surfaces in forms such as [s<sup>ʕ</sup>idʒdʒ] ‘truth’ and [s<sup>ʕ</sup>ɑ:dʒdʒ].<sup>24</sup>

According to Maṭar, exceptions to affrication consist of loanwords, as demonstrated in (33), or recent borrowings from CA/SA.

- |      |          |            |               |                        |
|------|----------|------------|---------------|------------------------|
| (33) | a. kabaṭ | ‘cupboard’ | b. kaḻaṭʃ     | ‘clutch’               |
|      | c. bre:k | ‘brake’    | d. kiʃaṭ      | ‘he went for a picnic’ |
|      | e. kaʃti | ‘picnic’   | f. ʔistika:na | ‘a teacup’             |

Counterexamples to Maṭar’s proposals are the items in (34), which are included in his data set. In (34a-c) affrication applies in the context of emphatics, whereas in (34d-e) the process is blocked in the context of front vowels.

- |      |                          |             |
|------|--------------------------|-------------|
| (34) | a. t <sup>ʕ</sup> əri:dʒ | ‘way, road’ |
|      | b. s <sup>ʕ</sup> ədi:dʒ | ‘friend’    |

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<sup>24</sup> Since these items do not exhibit alternation, they are considered in the current study to be lexically represented with the affricate, and therefore, synchronically unrelated to the verb [s<sup>ʕ</sup>idag] ‘truthful’.

- c. ɔ̌i:dʒ      ‘tightness, botherness’
- d. tiwahhag      ‘he got in trouble’
- e. ʃ haggə      ‘for what’

## 2.7 Maṭar (1985)

In this study Maṭar reports the existence of two distinct varieties in Bahrain, represented in the variety of Sitra and that of Muharrag. <k> affrication applies in both varieties, when adjacent to [i, i:, a, a:] (p. 157).<sup>25</sup> However, the affrication of <q> applies only in the variety of Muharrag, in which the process is conditioned by adjacency to front vowels. He also suggests that affrication is blocked in the environment of *mufaxxama* segments (p. 148). Many of the examples that Maṭar cites for <q> affrication in this variety are discussed in §1.3.2.1 above. The examples that he provides for [k] affrication are similar to those cited from Kuwaiti Arabic in Maṭar (1969) (see, above, §2.6). Maṭar indicates that that <q> affrication is variable in Bahraini Arabic, since the same items that undergo affrication in the speech of older speakers surface unaffricated in the speech of younger educated speakers (p. 148).

## 2.8 Al-amadidhi (1985)

This study investigates the affrication of <q> in QA from a sociolinguistic perspective.<sup>26</sup> That is, this study is not aiming at the phonological contexts for the processes that it investigates, though Al-amadidhi reports that the affricated variant of <q>, that is, [dʒ], is permitted only when adjacent to a front vowel (p. 86), and he mentions that “many exceptions to this rule” occur. He explains: “there are many items which meet the above phonological condition: yet they do not undergo the affrication process. An example of this is the word /daqī:qa/ ‘a minute’”.

Al-amadidhi reports that <q> affrication is a variable process, and whether or not it applies depends to a great extent on the speaker’s “social group membership, age, level of

<sup>25</sup> The last two vowels must be *muraqqāqa*, that is, not retracted. For [e:], see footnote (22), above. Maṭar suggests that the same condition applies to <k> affrication in QA (p. 157).

<sup>26</sup> <k> affrication is not investigated because /k/ did not occur frequently enough in the author’s corpus (p. 74).



education and style”. He finds that <q> affrication is a characteristic of the variety of the sedentary sector of the Qatari society (p. 182), and that it occurs in the speech of Bedouins only in the proper noun [dʒɑ:sim] (p.184). The process of <q> affrication, according to Al-amadidhi, is also “governed by the class of lexical items”, and he divides the lexicon into four classes that range from colloquial at one end to learned items at the other (p. 346). Accordingly, the more colloquial an item is, the more it is expected to undergo affrication, and vice versa.

## 2.9 Summary

In this chapter, I review a number of studies that investigated affrication in different varieties of Arabic. These studies agree on a number of issues:

1. With respect to the alternation between [g] and [dʒ], the underlying representation of this variable is assumed to be /q/ (cf. Cantineau, 1936, 1937). This assumption is rejected in the current study (§1.5).
2. The affrication of <k> and <q> is triggered by adjacency to front vowels or *Muraqqqa* consonants (Cantineau, 1936).
3. A large number of exceptions to this rule is admitted to exist, a fact that is not given any adequate explanation. Johnstone (1967, p. 6) states: “it should be noted that these affricates do not occur in every word in which it is theoretically possible for them to occur, and that occasionally they do occur in the contiguity of back vowels”.
4. The process is reported to be optional in the varieties of Qatar (Al-amadidhi, 1985), Kuwait (Johnstone, 1967; Maṭar, 1969) and Bahrain (Johnstone, 1967; Maṭar, 1985).
5. Excluding Johnstone (1967, 1978), [tʃ] is not considered to be a distinct phoneme in the relevant varieties.

### 3. AFFRICATION IN QATARI ARABIC: AN OT ANALYSIS

#### 3.0 Introduction

One of the characteristics of Qatari Arabic is the alternation between the velar stops [k] and [g] with the alveopalatal affricates [tʃ] and [dʒ], respectively. This is a variable process (Al-amadidhi, 1985) that was previously assumed to be triggered by adjacency to any front vowel, as in the other varieties of Arabic that exhibit these alternations (Cantineau, 1936, 1937; Johnstone, 1967, 1978; Maṭar, 1969, 1985; Al-amadidhi, 1985). This requirement is exemplified in (1).

- (1) i. [tʃ] occurs adjacent to front vowels, [k] occurs elsewhere:
- a. tʃiθi:r                      ‘many, a lot’
  - b. knɑ:r                      ‘lotus fruit’
  - c. miswa:k                      ‘a stick used traditionally for tooth brushing’
- ii. [dʒ] occurs adjacent to front vowels, [g] occurs elsewhere:
- a. ri:dʒ                      ‘saliva’
  - b. rju:g                      ‘breakfast’
  - c. bo:g                      ‘stealing’

Nevertheless, exceptions to this rule are not uncommon (Johnstone, 1967, 1978; Maṭar, 1969, 1985; Al-amadidhi, 1985). These authors recognize the existence of cases in which the condition of affrication, according to (1), is satisfied, yet affrication does not apply. This is shown in (2). In (3), although its condition is not met, affrication seems to apply.

- (2) a. ʔakil                      ‘food’
- b. kibar                      ‘he/it grew older/bigger’
- c. ʔakθar                      ‘more’
- d. ke:f                      ‘mood, liking’

e.	kasla:n	‘lazy’
f.	ʃankabu:t	‘a spider’
g.	rigad	‘he laid down’
h.	buχnag	‘a traditional outfit for girls’
i.	ge:s	‘hopscotch’
j.	gidar	‘he could’
k.	wagt	‘time’
l.	sagf	‘ceiling’
m.	digi:gø	‘a minute’
(3)		
a.	tʃtu:f	‘shoulders’
b.	tʃa:ʃid	‘severe, difficult’
c.	tʃa:n	‘then (discourse marker)’
d.	ɦnu:tʃ	‘chin (pl.)’
e.	rifdʒa:n	‘friends’
f.	ʃru:dʒ	‘vein (pl.)’
g.	dʒa:bal	‘to face’

Indeed, “it should be noted that these affricates do not occur in every word in which it is theoretically possible for them to occur, and that occasionally they do occur in the contiguity of back vowels” (Johnstone, 1967, p. 6). These exceptions constitute a problem that has not been adequately dealt with.

In the current study, by reconsidering the data in the light of new advancements in phonological theory, cases that were previously considered to be exceptions to affrication become completely transparent. Relevant recent developments include the restrictions imposed by the OCP on phonological representations (McCarthy, 1986; Yip, 1988; Frisch, Broe & Pierrehumbert, 2004) and the role of perception in shaping the grammar (e.g.,

Flemming, 1995; Jun, 1995; Côté, 2000, 2004; Boersma, 1998; Hume, 1999; Kochetov, 1999; Steriade, 1999a, b, 2001; Kang, 2000; Hume & Johnson, 2001). These developments establish the base for a proper account of affrication in QA, which in turn adds to our understanding of the process in general. Further, in this and the following chapters, evidence is provided for considering the OCP a synchronically active constraint in Arabic, restricting segmental alternations, in addition to restricting static patterns of phonological representation (Frisch & Zawaydeh, 2001). Affrication in QA is also noteworthy since it provides a unique case in which the interaction between phonology and morphology on the one hand, and between phonology and phonetics on the other, is observed.

Optimality Theory (Prince & Smolensky, 2004) (which holds that linguistic units are the outcome of the interaction among violable universal constraints) and its recent development into a model that may account for linguistic variation (Anttila, 1997; Anttila & Cho, 1998; Auger, 2001; among others), provide the analytical tools necessary to account for the data on affrication in QA.

Following the analysis presented at the end of chapter one (§1.5), I consider that surface [tʃ] and [dʒ] come from two possible sources: they can be the affricated variants of input /k/ and /g/, or the faithful outputs of the phonemes /tʃ/ and /dʒ/.

I consider affrication to be a place assimilation process between segments that share the feature [+high]. The trigger [i(:)], targets [k]/[g], and the outputs [tʃ] and [dʒ] are all [+high] segments. The velar stops, which are [dorsal], assimilate to the place feature of the vowel [i(:)] which is [coronal]. The outputs, therefore, are coronal affricates. The fact that this process results in affricates and not palatal stops could be due to the markedness of the latter segments. Cavar (2004) suggests that affricates are preferred over palatal stops due to their stridency, which she considers to be a cue enhancement element motivated by perceptual needs.

Affrication in QA is an optional phenomenon (Al-amadidhi, 1985), which is also the case in Kuwaiti Arabic (Johnstone, 1967; Maţar, 1969) and Bahraini Arabic (Johnstone, 1967; Maţar, 1985). I suggest that the context triggering affrication is not adjacency to any front vowel, as has been assumed in previous studies. Affrication may be triggered only when the velar stop is adjacent to the high front vowels [i] or [i:]. Also, in order for

affrication to apply, /k/ and /g/ must be adjacent to [i(:)], exclusively. Other segments, including front vowels that are [-high], block affrication. As predicted by OT, the context triggering the process must be found in the surface representation. As a consequence, affrication is blocked in the context of emphatic segments, which retract and lower vowels in their vicinity, even if the velar stop is adjacent to only /i(:)/ in the input. This restriction seems to be also applicable to affrication in other varieties of Arabic (Cantineau, 1936; Maṭar, 1969, 1985; Johnstone, 1978). Emphatic segments have been referred to as blockers of affrication, as will be discussed below (see also chapter 2, above). In addition, I suggest that affrication is blocked when the outcome would incur a violation of the OCP, a highly ranked constraint that restricts the co-occurrence of similar segments (Frisch et al., 2004).

The domain of affrication is found to be the stem. Therefore segments that are adjacent to [k] and [g] but not part of the stem do not affect the process. Due to paradigmatic effects, affrication does not apply to broken plurals, verbs, participles or verbal nouns.

I also discuss apparent counterexamples to my analysis. These are pairs of words that surface with [k] ~ [tʃ] or [g] ~ [dʒ] in contexts not predicted by my analysis. I demonstrate that these constitute cases of doublets, not affrication.

The chapter is organized as follows: In §3.1, I present the different approaches proposed to account for variation within OT. In §3.2 the distribution of [k] ~ [tʃ] and [g] ~ [dʒ] is discussed, including a presentation of the phonetic context triggering the process (a discussion of the feature specifications of the relevant segments is given in §1.6). The basic constraints employed to account for the alternations are introduced in section §3.3. The domain of the process is established in §3.4, and the interaction between affrication and paradigm uniformity requirements is discussed in §3.5. §3.6 discusses the restrictions imposed on affrication in the neighborhood of emphatic segments. §3.7 deals with the interaction between the OCP constraints and affrication. Apparent counterexamples are analyzed in §3.8, followed by a discussion of residuals in §3.9. The conclusion is given in §3.10, with a summary of the constraints employed to account for this phenomenon.

### 3.1 Formal approaches to variation within OT

There are different approaches to variation within OT. Kiparsky (1993) suggests that each speaker has multiple grammars that are differently ranked. When these grammars optimize distinct outputs, variation arises. Hammond (1994) on the other hand uses the notion of tied violations. Accordingly, when two or more candidates tie with respect to all the relevant constraints, these candidates become possible variants. A serious disadvantage of this approach is that there is always the possibility that lower ranked constraints become relevant and break the tie.

Reynolds (1994) suggests that variation is caused by the existence of floating constraints. Floating constraints are constraints that are crucially unranked with respect to a certain range of ranked constraints (see also Nagy & Reynolds, 1997). When the different sites at which a floating constraint is ranked result in distinct winning candidates, variation is observed.

Another approach to variation is proposed by Anttila (1997). Anttila proposes that there can be a number of constraints that are crucially unranked with respect to each other. This results in different orderings of these constraints in different occasions. When at least some of these orderings result in different optimal candidates, variation arises.

The stochastic OT grammar (e.g. Boersma & Hayes, 2001) assumes that constraints are ranked on a continuous scale of strictness. Each constraint has a ranking value. At every evaluation of the candidates a noise component is added to the ranking value of every constraint. The noise component has a normal distribution, with a mean of zero and an arbitrary standard deviation. The value of the noise component must be constant across constraints. As a result, constraints behave as if they have ranges of values and when these ranges overlap distinct outputs are obtained which results in variation. This approach can make accurate predictions regarding frequencies.

Coetzee (2004, 2005), on the other hand, emphasizes that constraints are strictly ranked. He departs from standard OT by assuming that EVAL imposes a harmonic rank-ordering on the set of candidates so that the higher position the candidate occupies, the more well-formed it is. Variation arises when the set of candidates provided by EVAL includes more than one well-formed candidate that can be accessed by the speaker. He also introduces the notion of the cut-off, which distinguishes between candidates that the

speakers have access to, therefore, are possible outputs, and those that they cannot access, which are ill-formed.

The stochastic OT grammar is the most powerful and flexible approach; in particular it makes very accurate predictions with respect to the frequency of the different acceptable variants. One drawback of Reynolds's or Anttila's approaches to variation is that the frequencies predicted by the model, which depend on the proportion of rankings that generate each of the possible outputs, crucially depend on the number of unranked constraints involved in the variation. Two unranked constraints, for example, can only generate two variants with a frequency of occurrence of 50% each. Frequencies of 80% and 20% can only be obtained with more constraints crucially unranked. By contrast, predicted frequencies in stochastic OT are independent from the number of constraints. However, since frequency data are not available in the current study, Anttila's notion of crucially unranked constraints will prove adequate and will be used in accounting for the variable nature of affrication (this chapter) and lenition (chapter 4). This is considered to be the standard approach to variation within OT.

### 3.2 The distribution of [k]/[g] and [tʃ]/[dʒ]

In QA, /k/ is realized phonetically as [k] or [tʃ]. /g/, however, is realized phonetically as [g], [dʒ], or [q]. The last variant may surface only when codeswitching to SA (see §1.3.3 above). The uvular stop [q] is used in formal settings or as a marker of the high level of education of the speaker. Since it is conditioned by extra-linguistic factors, [q] will be ignored in the analysis, which will be restricted to [g] and its affricate variant [dʒ]. The affrication of /k/ and /g/ is generally not affected by syllable structure, since both variants may surface in the onset and coda positions. The process is governed neither by higher prosodic constituents, such as the foot, the prosodic word, or the intonation phrase, nor by the position in the word, since both variants may occur word initially, word medially, and word finally.<sup>1</sup>

Contrary to the traditional assumption, I find that in QA affrication of the velar stops

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<sup>1</sup> However, actual cases in which affrication applies to [k] word finally were not found, due to the influence of other constraints.

applies only when adjacent to the high front vowel [i] or to its long counterpart [i:], which is indicated by the examples given in (4). These examples also demonstrate that the process is variable. Further, in order to undergo the process, the velar stop needs to be adjacent to [i(:)] exclusively, i.e, either word-initial, word-final, or between two occurrences [i(:)]. This restriction is apparent in the examples given in (5).

- |     |                 |           |                            |
|-----|-----------------|-----------|----------------------------|
| (4) | a. kiθi:r       | tʃiθi:r   | ‘plenty’                   |
|     | b. kibi:r/kbi:r | tʃibi:r   | ‘big’                      |
|     | c. ði:k         | ði:tʃ     | ‘that (f.)’                |
|     | d. giri:b       | dʒiri:b   | ‘close by’                 |
|     | e. rigi:g       | ridʒi:dʒ  | ‘thin, transparent’        |
|     | f. ri:g         | ri:dʒ     | ‘saliva’                   |
|     | g. digi:g       | didʒi:dʒ  | ‘thin, small’              |
|     | h. gili:l       | dʒili:l   | ‘little quantity, lacking’ |
|     | i. gi:mʒ        | dʒi:mʒ    | ‘price’                    |
| (5) | a. jamkin       | *jamtʃin  | ‘maybe’                    |
|     | b. la:kin       | *la:tʃin  | ‘but’                      |
|     | c. mikadda      | *mitʃadda | ‘a job, hardship’          |
|     | d. waki:l       | *watʃi:l  | ‘representative’           |
|     | e. kadir        | *tʃadir   | ‘soiled’                   |
|     | f. kafi:l       | *tʃafi:l  | ‘guarantor’                |
|     | g. ʔakla        | *ʔatʃla   | ‘food (sg.)’               |
|     | h. kari:h       | *tʃari:h  | ‘awful’                    |
|     | i. ko:s         | *tʃo:s    | ‘a dusty wind’             |
|     | j. ligan        | *lidʒan   | ‘a large dish’             |



k. saɣi:	*sadʒi:	‘high tide’
l. ʔablag	*ʔabladʒ	‘s.o. with protrusive eyes’
m. lge:ma:t	*ldʒe:ma:t	‘dumplings’
n. ʕinge:ʃ	*ʕindʒe:ʃ	‘fruit seed’
o. ʕangaz	*ʕandʒaz	‘chicken pox’
p. fo:g	*fo:dʒ	‘up, above’
q. gubgub	*dʒubdʒub	‘crab’

Interestingly, in their experimental study, Cole and Iskarous (2001) find that an adjacent front vowel (in their experiment: [i, e]) “inhibits the identification” of [g], and an adjacent back vowel ([u, o]) enhances the identification of this segment.<sup>2</sup> The identification of [g] is found to be worst when preceded and followed by a front vowel. The stimuli used were nonsense words. The purpose of this experiment was to investigate the identification/perception of C-Place features of stops in intervocalic position. Unfortunately, they did not test the perception of [k]. However, because of the similarity of [k] and [g], these findings could be argued to be applicable to [k]. Therefore, perception could partly motivate affrication to [tʃ] and [dʒ] in the context in which the velar stops are not easily identifiable, that is, adjacent to [i(:)] (see also Cavar, 2004).

The restriction of the affrication context to [i(:)] is consistent with cross-linguistic observations. Hock (1991, p. 75) finds that palatalization, including affrication, “tends to be ‘governed’ by a hierarchy of conditioning environments; the most conducive environment is [y],<sup>3</sup> the least conducive one, [æ]” with the intermediate levels including [i] and [e]. In other words, the higher the front vocoid, the stronger its ability to trigger affrication. The vocalic trapeze also shows that the higher the vowel, the more front it is, and consequently, the more it is capable of attracting /k/ and /g/.<sup>4</sup>

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<sup>2</sup> They do not indicate whether or not there was a difference between the effect of [i] and that of [e].

<sup>3</sup> [y] represents the palatal glide [j].

<sup>4</sup> The distinction between [i(:)], which triggers affrication, and the other front vowels [e:] and [a], which block

In addition to the cases in which the [k] ~ [tʃ] and [g] ~ [dʒ] alternations are observed, there exist a number of items that surface invariably with the affricates [tʃ] or [dʒ], although, historically, they may be derived from /k/ or /g/, respectively. I argue that these items are lexicalized with /tʃ/ or /dʒ/ in QA. Among these are items in which [tʃ] or [dʒ] surface adjacent to back vowels and different kinds of consonants, as demonstrated in (6) and (7).

- |     |               |        |                  |
|-----|---------------|--------|------------------|
| (6) | a. tʃɑ:mlɜ    |        | ‘p.n. (f.)’      |
|     | b. dʒɑ:sim    |        | ‘p.n. (m.)’      |
|     | c. dʒɑ:bal    |        | ‘to face’        |
|     | d. il-dʒɑ:blɜ |        | ‘tomorrow night’ |
| (7) | Singular      | BP     |                  |
|     | a. wartʃ      | wru:tʃ | ‘thigh’          |
|     | b. hintʃ      | hnu:tʃ | ‘chin’           |
|     | c. ʃiltʃ      | ʃlu:tʃ | ‘chewing gum’    |
|     | d. haldʒ      | hlu:dʒ | ‘mouth’          |
|     | e. dʒidir     | dʒdu:r | ‘cooking pot’    |

The affricates in these items could be cases that underwent affrication at an earlier stage in the history of the variety, in case there was a stage in which the process applied in a wider range of contexts. Another possibility is that these items were borrowed from other nearby varieties. But since these items surface invariably with the affricate in the synchronic grammar of QA, I propose that they have come to be represented underlyingly with that segment.

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it, could be tied to Watson’s (2002) suggestion that [e] and [a] are distinguished from [i] by having the feature [guttural], which is a non-primary feature in the case of [e]. The features that she assigns to these segments are based on their phonetic implementation in the dialects of Cairo and San’a.

### 3.3 Basic constraints

The situation described in §3.2 is mainly the result of the interaction of two constraints that allow the affricate in the contexts exemplified in (4), and enforce the velar stop in other contexts. The first constraint, which is given in (8), belongs to the faithfulness family (McCarthy & Prince, 1995). It militates against changes in the place of articulation.

- (8) Faithfulness: MAX-IO(dorsal)<sup>5</sup>

Every [dorsal] specification in the input is present in the output.

The second constraint belongs to the markedness family. It requires that [k] and [g] occur adjacent to segments other than [i(:)]. The definition of this constraint is given in (9).

- (9) Markedness constraint: [k]/[g] <--> ¬ [i(:)]<sup>6</sup>

[k]/[g] occur adjacent to a segment other than [i(:)]. (To be modified)

<--> means ‘adjacent’.

¬ means ‘not’.

Constraint (9) is not violated unless the velar stop is adjacent to [i(:)], exclusively. To account for the variability of the process, constraints (8) and (9) need to be crucially unranked with respect to each other, as suggested by Anttila (1997), Anttila & Cho (1998), (Côté, 2000) and Auger (2001) among others.<sup>7</sup> Each time a speaker utters a word including an underlying /k/ or /g/, the two constraints are randomly ranked (with respect to each other) and the actual output depends on which of the two constraints is ranked higher than the

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<sup>5</sup> MAX-IO(dorsal) is employed instead of IDENT-IO(dorsal) because MAX/DEP constraints are found to better accommodate the different factors influencing both processes: affrication and lenition in QA. For justifying the existence of MAX-F constraints, the reader is referred to Lamontagne & Rice (1995) Pulleyblank (1996), Causley (1997), Walker (1997, 1999), Lombardi (1998, 2001), Zhang (2000).

<sup>6</sup> The format of this constraint enforcing adjacency is borrowed from Côté (2000).

<sup>7</sup> An alternative to crucially unranked constraints is to suggest that these two constraints are tied. If the notion of tied constraints is adopted, then we need to assume that there are no lower ranked constraints that are relevant and which may affect the evaluation of candidates. However, the distinction between these two possibilities is crucial in §3.5.3.

other, at that specific moment.<sup>8</sup>

In order to ensure that the non-faithful variant of /k/ is [tʃ] and that of /g/ is [dʒ], not other segments, a generic faithfulness constraint is necessary. Constraint (10a) needs to outrank constraints (8) and (9), as shown in tableau (1).

(10) a. FAITH-F

Output correspondents of an input [αF] segments are also [αF].

(Correspondent segments in input and output have identical values for [voice], [high] and [cont]).

b. Faith-F » MAX-IO (dorsal), [k]/[g] <--> ¬[i(:)].

Tableau (1) shows how the output of the interaction among the three constraints in contexts other than that triggering affrication is obtained. The faithful candidates (i)a and (ii)a violate none of the constraints (including the markedness constraint [k]/[g] <--> ¬[i(:)], since the velar stops are adjacent to [a] in these forms) and are necessarily optimal. All the other candidates are ruled out by virtue of being unfaithful to the input in at least one of the features [high], [voice], or [cont].

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<sup>8</sup> When the unranking of two constraints results in two outputs, it is predicted that each variant has an equal chance of winning. However, extra-grammatical factors, such as age, sex and level of education may favor one of the variants.

Tableau (1)

Constraint ranking: Faith-F » MAX-IO (dorsal), [k]/[g] &lt;--&gt; ¬[i(:)]

i. /la:kin/	FAITH-F	MAX-IO (dorsal)	[k]/[g] <--> ¬[i(:)]
a. <del>la:</del> la:kin			
b. la:tʃin		*!	
c. la:gin	*!		
d. la:qin	*!		
e. la:dʒin	*!	*	
f. la:ɸin	*!***		
g. la:χin	*!*		
h. la:ʃin	*!	*	
ii. /ligan/			
a. <del>li:</del> ligan			
b. lidʒan		*!	
c. litʃan	*!	*	
d. liqan	*!*		
e. liɸan	*!*		
f. liχan	*!***		
g. liʃan	*!*	*	
h. likan	*!		

Tableaux (2) and (3) illustrate how to obtain variation between [k] and [tʃ] on the one hand, and [g] and [dʒ] on the other, in the context triggering affrication. This is as the result of crucially unranking the markedness constraint [k]/[g] <--> ¬[i(:)] and the faithfulness constraint MAX-IO(dorsal). If MAX-IO(dorsal) is ranked higher than [k]/[g] <--> ¬[i(:)], as in tableau (2), then the output of /kiθi:r/ is candidate (i)a and that of /ri:g/ is candidate (ii)a, each containing a segment [k]/[g] that is not adjacent to a segment other than [i(:)], in violation of [k]/[g] <--> ¬[i(:)]. If on the other hand, the markedness constraint outranks MAX-IO(dorsal), then the optimal candidates are (i)b and (ii)b, as in tableau (3).

Tableau (2)

Constraint ranking: FAITH-F » MAX-IO(dorsal)» [k]/[g] &lt;--&gt; ¬[i(:)]

i. /kiθi:r/	FAITH-F	MAX-IO(dorsal)	[k]/[g] <--> ¬ [i(:)]
a. <del>ɪ</del> kiθi:r			*
b. tʃiθi:r		*!	
c. giθi:r	*!		
d. qiθi:r	*!		
e. dʒiθi:r	*!	*	
f. ɸiθi:r	*!***		
g. χiθi:r	*!*		
h. ʃiθi:r	*!	*	
ii. /ri:g/			
a. <del>ɪ</del> ri:g			*
b. ri:dʒ		*!	
c. ri:tʃ	*!	*	
d. ri:q	*!*		
e. ri: ɸ	*!*		
f. ri:χ	*!***		
g. ri:ʃ	*!*		
h. ri:k	*!		

Tableau (3)

Constraint ranking: FAITH-F » [k]/[g] <--> ¬[i(:)] » MAX-IO(dorsal)<sup>9</sup>

i. /kiθi:r/	FAITH-F	[k]/ [g] <--> ¬ [i(:)]	MAX-IO(dorsal)
a. kiθi:r		*!	
b. <del>ɪ</del> tʃiθi:r			*
ii. /ri:g/			
a. ri:g		*!	
b. <del>ɪ</del> ri:dʒ			*

<sup>9</sup> Although constraint (10), that is FAITH-F, is not shown in the subsequent tableaux, it should be considered present.

### 3.4 The stem as the domain of affrication

#### 3.4.1 Suffixation and cliticization

The domain of affrication is the *stem*. Therefore neither suffixation nor cliticization affect the process, as shown in (11).<sup>10</sup> The stem is considered to be “the bare word prior to the affixation of any suffixes or prefixes, but after any stem-internal changes” (Watson, 2002, p. 130).

(11)	a. digi:g- $\text{v}$	didʒi:dʒ- $\text{z}$	‘thin, small (f.)’
	b. rigi:g- $\text{v}$	ridʒi:dʒ- $\text{z}$	‘transparent, delicate (pl. non-human)’
	c. ri:g-ha	ri:dʒ-ha	‘her saliva’
	d. t <sup>ʕ</sup> ri:g-na	t <sup>ʕ</sup> ri:dʒ-na	‘two ways’
	e. t <sup>ʕ</sup> ri:g-kum	t <sup>ʕ</sup> ri:dʒ-kum	‘your (pl.) way’

The feminine morpheme [ʒ]/[v]<sup>11</sup> is suffixed to adjectives that modify singular feminine nouns, as in (11a). It also attaches and assigns the feminine gender to adjectives that modify plural non-human nouns, as exemplified in (11b).<sup>12</sup> In both cases, this morpheme does not affect the context of affrication. The nouns in (11c-e) are suffixed by the possessive pronouns -ha, -na and -kum which are assumed to be clitics (McCarthy, 2005). Like the feminine morpheme, these clitics do not block affrication. This is because the feminine morpheme in (11a-b), and the clitics in (11c-e) are outside the application domain of the process, which is the stem.

<sup>10</sup> Similar examples in which /k/ affrication is triggered word finally were not found. This is undoubtedly an accidental gap, due to the lower frequency of [k] compared to that of [g]/<q> in the language (Mrayati, 1984, p. 98), rather than a restriction on the sequence [i(:)k] word finally, since items including this sequence are observed. However, due to the influence of other constraints, affrication is blocked in these items (see §3.5.1).

<sup>11</sup> This morpheme has two surface representations as indicated in the examples above. Bukshaisha (1985) seems to recognize two allomorphs of this morpheme, /i/ and /a/, the first surfacing as [ʒ] and the second as [v], without specifying a context for either. However, based on data given in Bukshaisha (1985) and in Al-Sulaiti (1993), I conclude that [v] surfaces when preceded by one of the dorso-pharyngeal segments, a class that includes, according to McCarthy (1994, p. 220), the velars, uvulars, pharyngeals, laryngeals and emphatics, and [ʒ] appears elsewhere.

<sup>12</sup> It is also possible that the feminine morpheme in (11a) is different from that in (11b).

### 3.4.2 Stem-internal modifications

Since the domain of affrication is the stem, any modification to the stem potentially affects the context in which the process may apply. This is evident in the broken plurals of singular forms that may undergo affrication. When broken plural formation involves internal modifications to a stem (Wright 1967, vol.1, McCarthy & Prince 1990, p. 211) in ways that remove the phonetic context triggering affrication, the process is blocked in these plural forms. This is illustrated in (12), where variable affrication in singular forms (first column) is blocked in the corresponding broken plurals (second column).

(12)	Singular		BP
a.	kiθi:r/tʃiθi:r	‘many’	kθa:r/*tʃθa:r
b.	kibi:r/tʃibi:r	‘big’	kba:r/*tʃba:r
c.	tʰiri:g/tʰiri:dʒ	‘way’	tʰurug/*tʰurudʒ
d.	giri:b/dʒiri:b	‘close by’	gra:b/*dʒra:b
e.	digi:g/didʒi:dʒ	‘thin, small’	dga:g/*ddʒa:dʒ
f.	rigi:g/ridʒi:dʒ	‘transparent, thin’	rga:g/*rdʒa:dʒ
g.	gili:l/dʒili:l	‘small quantity’	gla:l/*dʒla:l

The definition of the constraint given in (9) needs to be modified, in order to account for the fact that the phonetic context of affrication needs to be met within the stem. Therefore, a new definition is given to this constraint in (13).

(13) Markedness: [k]/[g] <--> ¬[i(:)]<sub>Stem</sub>

[k] and [g] occur adjacent to segments other than [i(:)] within the stem.

In a form like [ri:g-ha] (11c), constraint (13) is violated since [g] is only adjacent to [i:] in the stem, and affrication optionally applies, as in tableaux (2) and (3).



### 3.5 Paradigm Uniformity effects

It is widely observed that words that are related either derivationally, inflectionally or even in both ways resist certain phonological processes or over-apply them in order to keep identity with the rest of the paradigm members they belong to. Constraints forcing unity in derivational or inflectional paradigms or output-output faithfulness constraints (McCarthy & Prince, 1995) are proposed in many studies to account for such situations in different languages. Among these are Benua (1997), Hayes (1998), Steriade (2000), Burzio (1994), Kenstowicz (1996; 1998), McCarthy (2005), Gafos (2003) and Albright (2004). With respect to affrication in QA, it appears that different lexical classes interact differently with paradigmatic effects, as discussed in the subsequent sections.

#### 3.5.1 Broken plurals

The phonetic conditioning of affrication is met in a number of broken plural forms as shown in (14). However, the process does not apply to these forms.

(14)	BP	Singular	
a.	misa:wi:k	miswa:k	‘a traditional toothbrush’
b.	siki:k	sikkə	‘road/street’
c.	ʃiba:bi:k	ʃibba:k	‘a window’
d.	kisa:lɜ	kasla:n	‘lazy’
e.	giʃra:n	ʔagʃar	‘aggressive’
f.	baχa:nig	buχnag	‘a traditional outfit for girls’
g.	giba:gib <sup>13</sup>	gubgub	‘a crab’

Notice that the phonetic conditioning of affrication is not met in the singular forms of these broken plurals. I find this to be motivating affrication blockage in the broken plural forms.

<sup>13</sup> Since this item is a case of reduplication, Base-Reduplicant-faithfulness could equally account for the blockage of affrication in the first /g/ in the plural form in (14g); see McCarthy & Prince (1995). Another item that may be subject to Base-Reduplicant-faithfulness is [giringaʔo:] ‘a traditional event, similar to Halloween’.

Affrication under-applies in the broken plural forms that meet the phonetic conditioning of the process, if their singular forms do not undergo the process. These examples indicate that there is a paradigmatic effect that is forcing the broken plural forms to copy their singular bases with respect to the variant they adopt for underlying /k/ and /g/. The constraint responsible for this effect is given in (15a). This constraint must outrank the markedness constraint  $[k]/[g] \leftrightarrow \neg[i(:)]_{\text{Stem}}$ , as indicated in (15b).

(15) a. MAX-OO(dorsal)


Every [dorsal] specification in a base form is present in derived forms.

b. MAX-OO(dorsal) »  $[k]/[g] \leftrightarrow \neg[i(:)]_{\text{Stem}}$ , MAX-IO(dorsal)

The base in nominal/adjectival paradigms is usually the singular form. In the current case, the inflected form is the broken plural. In tableau (4), the singular of (14a) is evaluated and constraint (15) is irrelevant to the base since the inflected form is required to mimic the base, not vice versa. In this tableau, candidate (b) violates MAX-IO(dorsal), and as a result, candidate (a) becomes optimal.

Tableau (4)


Constraint ranking:  $[k]/[g] \leftrightarrow \neg[i(:)]_{\text{Stem}}$ , MAX-IO(dorsal)

/miswɑ:k /	$[k]/[g] \leftrightarrow \neg[i(:)]_{\text{Stem}}$	MAX-IO(dorsal)
a.  miswɑ:k		
b. miswɑ:tʃ		*!

To evaluate the broken plural of (14a), constraint (15a) is included in tableau (5). Since candidate (b) violates MAX-OO(dorsal), in addition to violating MAX-IO(dorsal), candidate (a) is optimal.

Tableau (5)

Constraint ranking: MAX-OO(dorsal)» [k]/[g] <--> ¬[ i(:)]<sub>Stem</sub>, MAX-IO(dorsal)

/misa:wi:k/	MAX-OO(dorsal)	[k]/[g] <--> ¬[ i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  misa:wi:k		*	
b. misa:wi:tʃ	*!		*



In the case of the items given in (12), repeated here as (16), there is variation in the base forms but not in the broken plural forms.

(16)	Singular	BP	
a.	kiθi:r/tʃiθi:r	kθa:r/*tʃθa:r	‘many’
b.	kibi:r/tʃibi:r	kba:r/*tʃba:r	‘big’
c.	tʃiri:g/tʃiri:dʒ	tʃurug/*tʃurudʒ	‘way’
d.	giri:b/ dʒiri:b	gra:b /*dʒra:b	‘close by’
e.	digi:g/didʒi:dʒ	dga:g/*ddʒa:dʒ	‘thin, small’
f.	rigi:g/ridʒi:dʒ	rga:g/*rdʒa:dʒ	‘transparent, thin’
g.	gili:l/dʒili:l	gla:l/*dʒla:l	‘small quantity’

In tableau (6), candidates for the singular of (16d) are evaluated. Since the two relevant candidates incur the same number of violations to the crucially unranked constraints, each of them is optimal in one of the two possible rankings of these constraints.

Tableau (6)

Constraint ranking: [k]/[g] <--> ¬[ i(:)]<sub>Stem</sub>, MAX-IO(dorsal)


/giri:b/	[k]/[g] <--> ¬[ i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  giri:b	*	
b.  dʒiri:b		*

However, the broken plural of this form surfaces invariably with the velar stop, as shown in

tableau (7). Here, each candidate is faithful to one of the variants of the base. [gra:b] is faithful to [giri:b] and [dʒra:b] to [dʒiri:b]. Therefore, none of them violates MAX-OO(dorsal). However, since candidate (b) violates MAX-IO(dorsal), the faithful candidate (a) becomes optimal.

Tableau (7)

Constraint ranking: MAX-OO(dorsal) » [k]/[g] <--> ¬[i(:)]<sub>Stem</sub>, MAX-IO(dorsal)

/gra:b/	MAX-OO(dorsal)	[k]/ [g]<--> ¬[i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  gra:b			
b. dʒra:b			*!

### 3.5.2 Nouns of individuality

Another case in which affrication is blocked due to paradigm uniformity effects is exemplified by (17a-b). (17b) is the unit form of the collective noun given in (17d). Items such as (17a) are called “nouns of individuality” and they “designate one individual out of a genus, or one part of a whole that consists of several similar parts” (Wright, 1967, vol. 1, p. 147). In SA, nouns of individuality are formed by suffixing <-at> to the collective noun (see also, Azami, 1988, p. 320).<sup>14</sup> This means that the collective noun is the base from which the noun of individuality is derived.

Since the phonetic context of affrication is not met in the base form given in (17d), the process is blocked in the inflected form (17a) by MAX-OO(dorsal). Affrication is also blocked in the dual form (17b), because the base of this form, (17a), does not undergo the process. In (17c) on the other hand, affrication is blocked anyway, since its phonetic condition is not met.

- (17) a. wriɡ-ʋ                      ‘a sheet of paper’  
       b. wriɡ-te:n                ‘two sheets of paper’


<sup>14</sup> In QA, however, the vocalic pattern may change slightly as well. The derivation of these nouns is as follows: warag > wriɡ-ʋ(t) > wriɡ-te:n, ʔawra:g.

- c. ʔawra:g                    ‘papers’  
 d. waraɡ                    ‘paper’

In tableau (8), candidates for the base of the paradigm given in (17) are evaluated. Since the phonetic conditioning of affrication is not met in this form, the process does not apply.

Tableau (8)



Constraint ranking: [k]/[g] <--> ¬[ i(:)]<sub>Stem</sub>, MAX-IO(dorsal)

/waraɡ/	[k]/[g]<--> ¬[ i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  waraɡ		
b. waraɖ		*!

In (i) of tableau (9), candidates for the inflected form of the base, in this case the noun of individuality, are evaluated. And in (ii) of the same tableau, candidates for an inflected form that is derived from the noun of individuality are evaluated. Both forms surface with [g], which is the variant that surfaces in the base of each form.

Tableau (9)

Constraint ranking: MAX-OO(dorsal) » [k]/[g] <--> ¬[ i(:)]<sub>Stem</sub>, MAX-IO(dorsal)







i. /wrig-a/	MAX-OO(dorsal)	[k]/[g]<--> ¬[ i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  wrig-ɐ		*	
b. wridʒ-ɐ	*!		*
ii. /wrig-te:n/			
a.  wrig-te:n		*	
b. wridʒ-te:n	*!		*

If, on the other hand, the context triggering affrication is met in both the base and the inflected form, affrication applies to both forms, as exemplified in (18) and shown in tableau (10).

- (18) a. ɦari:g/ɦari:dʒ ‘fire’  
 b. ɦari:g-v/ɦari:dʒ-3 ‘fire (sg.)’  
 c. ɦara:jiq/ɦara:ji:dʒ ‘fire (pl.)’

Tableau (10)

Constraint ranking: MAX-OO(dorsal) » [k]/[g]<--> ¬ [i(:)]<sub>Stem</sub>, MAX-IO(dorsal)

i. /hari:g/	MAX-OO(dorsal)	[k]/[g]<--> ¬ [i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  hari:g		*	
b.  hari:dʒ			*
ii. /hari:g-a/			
a.  hari:g-ɐ		*	
b.  hari:dʒ-ɜ			*
iii. /hara:jig/			
a.  hara:jig		*	
b.  hara:jidʒ			*

### 3.5.3 Verbs

None of the items undergoing affrication in (4), above, are verbs. This fact may indicate that affrication is blocked in verbs. Indeed, although many verbs meet the phonetic conditioning of affrication, they do not undergo the process, as illustrated in (19).

- |      |            |          |                    |
|------|------------|----------|--------------------|
| (19) | a. kifal   | *tʃifal  | ‘he guaranteed’    |
|      | b. kint    | *tʃint   | ‘I was, you were’  |
|      | c. ɸarrik  | *ɸarritʃ | ‘you move (s.th)!’ |
|      | d. kisar   | *tʃisar  | ‘he broke’         |
|      | e. ja-zlig | *jazlidʒ | ‘he slips’         |
|      | f. gidar   | *dʒidar  | ‘he could’         |
|      | g. gimt    | *dʒimt   | ‘I got up’         |
|      | h. gilt    | *dʒimt   | ‘I said’           |

i. j-ħadig      \*j-ħadidʒ      ‘he fishes’

The same pattern is observed in verbs that share their consonantal roots and semantic fields with nouns/adjectives that may undergo affrication. This is exemplified in (20) in which an example of one verbal form is given for each of the items undergoing affrication in (4) above that have verbal correspondents in QA.

(20)	Verb form		Adjectival correlate	
a.	kiθar	‘it increased’	(kiθi:r/tʃiθi:r)	‘plenty’
b.	kibar	‘it/he became big/old’	(kibi:r/tʃibi:r)	‘big’
c.	j-garrib	‘he becomes close by’	(giri:b/dʒiri:b)	‘close by’
d.	j-daggig	‘he makes small’	(digi:g/didʒi:dʒ)	‘tiny’
e.	j-rigg	‘it becomes delicate’	(rigi:g/ridʒi:dʒ)	‘delicate’
f.	j-gəɫʰɪ	‘it becomes little’	(gili:l/dʒili:l)	‘little’
g.	ji-trajjag	‘he has breakfast’	(ri:g/ri:dʒ)	‘spittle’

The motivation for this pattern seems to be the need for paradigm uniformity in inflectionally related verbs. Any verbal inflectional paradigm in QA may include as many as nineteen members that represent different combinations of inflection for tense, aspect, person, gender, and number. It is not possible to have the condition of affrication met in all of these members in any paradigm. This is because, in addition to affixation, which I suggest does not affect the context of affrication, the stem adopts different templates in each verbal form. Hence, if the condition of affrication is met in some members of a certain paradigm, it is not met in other members of that paradigm, as illustrated in (21).

(21)	a. kifal, ja-kfil	‘he guaranteed, he guarantees’
	b. kint, ka:n	‘I was, he was’
	c. ħarrik, ħarrak	‘you move (s.th), he moved (s.th.)’
	d. kisar, ja-ksir	‘he broke, he breaks’

e. zilag, ta-zlig-i:n	‘he slipped, you slip (f.)’
f. gidar, ʔa-gdar	‘he could, I can’
g. ginaʃ, j-ignaʃ	‘he got satisfied, he gets satisfied’
h. gu:m, gimt	‘you get up!, I got up’
i. ga:l, gilt	‘he said, I said’
j. hadag, j-ħadig	‘he fished, he fishes’
k. ʃarrag, j-ʃarrig	‘he sweated, he sweats’

Therefore, instead of including members that surface variably with [k]/[g] and [tʃ]/[dʒ], and others that surface only with [k]/[g], the grammar chooses to be faithful to the underlying segments throughout the paradigms. The output-output faithfulness constraint proposed for nominal/adjectival paradigms cannot account for affrication blockage in verbal paradigms. The items in (21) indicate that in verbal paradigms there is not a certain form/base in which the condition of affrication is constantly not met, and therefore the process is blocked throughout the paradigm. Rather, these items show that the context triggering affrication can be available in different kinds of inflectional forms and still the process does not apply. The fact that there is not a certain base in verbal paradigms is exactly what the Optimal Paradigms Model predicts (McCarthy, 2005). According to this model, all the members of verbal inflectional paradigms are equal. This distinguishes between nominal/adjectival paradigms, which always have bases, as discussed above, and verbal paradigms, which have none. The OP constraint responsible for affrication blockage in verbal paradigms is given in (22a) and must be ranked according to (22b).

(22) a. Faithfulness: MAX-OP(dorsal)

A [dorsal] specification in a member of an inflectional paradigm is present in every other member of that paradigm.

b. MAX-OP(dorsal) » [k]/[g]<--> ¬ [-back, +high]<sub>Stem</sub>, MAX-IO(dorsal)

According to (22a), each member of a verbal paradigm is compared to each other member of





that paradigm, with respect to its specifications for the place feature [dorsal]. As a result of highly ranking this constraint, the stem in each member of verbal inflectional paradigms is faithful to the stem in the other members in that paradigm with respect to the variant adopted for underlying /k/ and /g/ (McCarthy, 2005). The patterning of verbs with respect to affrication indicates that there is no base in verbal inflectional paradigms (c.f. Benmamoun, 1999; and references therein).

In tableau (11), each candidate consists of a whole inflectional paradigm, and the members of each candidate are evaluated simultaneously. In addition, the violations incurred by the members of a given paradigm are added up together (McCarthy, 2005). Candidate (a) consists of a paradigm whose members surface invariably with [g], though some of them host the phonetic conditioning of affrication. Candidate (b) consists of a paradigm that surfaces invariably with the affricate. Candidate (c) consists of a paradigm whose members vary with respect to the variant adopted as a surface representation of /g/, [dʒ] adjacent to [i(:)], [g] elsewhere.

Tableau (11)

Constraint ranking: MAX-OP(dorsal) » [k]/[g] <--> ¬ [ i(:)]<sub>Stem</sub>, MAX-IO(dorsal)

/gidar, agdar.../	MAX-OP(dorsal)	[k]/[g] <--> ¬ [ i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a.  gidar, ʔagdar		*	
b.  dʒidar, ʔadʒdar			**
c. dʒidar, ʔagdar	*!*		*

Notice that the fact that the markedness constraint [k]/[g] <--> ¬ [ i(:)]<sub>Stem</sub> and the faithfulness constraint MAX-IO(dorsal) are unranked with respect to each other permits candidate (b) to be optimal, when [k]/[g] <--> ¬ [ i(:)]<sub>Stem</sub> outranks MAX-IO(dorsal). Consequently, both variants, [g] and [dʒ], are expected to surface in each form, as illustrated in tableaux (12) and (13). This is not the correct result.

Tableau (12)

Constraint ranking: MAX-OP(dorsal) » MAX-IO(dorsal) » [k]/[g] <--> ¬ [i(:)]<sub>Stem</sub>



/gidar, agdar.../	MAX-OP(dorsal)	MAX-IO(dorsal)	[k]/[g] <--> ¬ [i(:)] <sub>Stem</sub>
a.  gidar, ʔagdar			*
b. dʒidar, ʔadʒdar		*!*	
c. dʒidar, ʔagdar	*!*	*	

Tableau (13)

Constraint ranking: MAX-OP(dorsal) » [k]/[g] <--> ¬ [i(:)]<sub>Stem</sub> » MAX-IO(dorsal)

/gidar, agdar.../	MAX-OP(dorsal)	[k]/[g] <--> ¬ [i(:)] <sub>Stem</sub>	MAX-IO(dorsal)
a. gidar, ʔagdar		*!	
b.  dʒidar, ʔadʒdar			**
c. dʒidar, ʔagdar	*!*		*

There are two possible ways to rule out candidate (b). The first is to propose an additional constraint, which is given in (23).

(23) a. Markedness: [tʃ]/[dʒ] <--> [i(:)]

[tʃ] and [dʒ] are adjacent to [i(:)].

b. [dʒ] <--> [i(:)], MAX-OP(dorsal) » [k]/[g] <--> ¬ [i(:)]<sub>Stem</sub>, MAX-IO(dorsal).

The ranking proposed in (23b) ensures that the faithfulness constraint MAX-OP(dorsal) is always satisfied by a candidate that is faithful to the inputs /k/ and /g/, as demonstrated in tableau (14).<sup>15</sup>

<sup>15</sup> Notice that the constraint in (23) does not prevent an input /dʒ/ or /tʃ/ from surfacing faithfully next to [i(:)] if this constraint is dominated by all the relevant FAITH-F constraints, including MAX-IO(coronal).

Tableau (14)

Constraint ranking:  $[dʒ] \leftrightarrow [i(:)]$ , MAX-OP(dorsal) »  $[k]/[g] \leftrightarrow \neg [i(:)]_{\text{stem}}$ , MAX-IO(dorsal)

/gidar, agdar.../	$[dʒ] \leftrightarrow [i(:)]$	MAX-OP (dorsal)	$[k]/[g] \leftrightarrow \neg [i(:)]_{\text{stem}}$	MAX-IO (dorsal)
a. <del>g</del> gidar, ʔagdar			*	
b. dʒidar, ʔadʒdar	*!			**
c. dʒidar, ʔagdar		*!*		*

Alternatively, it could be suggested that the markedness constraint  $[k]/[g] \leftrightarrow \neg [i(:)]_{\text{stem}}$  and the faithfulness constraint MAX-IO(dorsal) are tied (Broihier, 1995, Pesetsky, 1997) instead of being crucially unranked with respect to each other. In this case, the constraint given in (23) is unnecessary and candidate (a) in tableaux (11-14) is optimal by incurring fewer violations to the markedness constraint  $[k]/[g] \leftrightarrow \neg [i(:)]_{\text{stem}}$  than the violations to the faithfulness constraint MAX-IO(dorsal), incurred by candidate (b). However, it should be noted that the tied constraints approach cannot be used in the case of lenition. In §3.1, above, I indicate that the tied constraints approach cannot be adopted if there are lower ranked constraints that can break the tie. In the current study, the constraints governing affrication must be dominated by those governing lenition. This allows the constraints governing affrication to be able to break the tie between the constraints governing lenition and consequently affect the output.

#### 3.5.4 Participles and verbal nouns

The phonetic conditioning of affrication is met in a number of active participles and verbal nouns (a type of infinitive), as illustrated in (23). All of the active participles and some of the verbal nouns in (24) meet the condition of affrication but resist it. The empty slots represent non-existing forms in QA.

(24)	Verb	Active participle	Verbal noun	
	a. ɣarrak	<b>mɣarrik</b>	<b>taɣri:k</b>	‘to move (s.th.)’
	b. tiɣarrak	<b>miɣarrik</b>	-----	‘to move (reflexive)’

c. tannak	<b>mtannik</b>	-----	‘to be stubborn/dumb’
d. ʕiʕag	<b>ʕa:ʕig</b>	<b>ʕiʕig/ʕiʕg</b>	‘to love’
e. χinag	<b>χa:nig</b>	χang	‘to strangle’
f. ʕallag	<b>m-ʕallig</b>	<b>taʕli:g</b>	‘to hang’
g. hirag	<b>ħa:rig</b>	ħarg	‘to burn’
h. hidag	<b>ħa:dig/mħadig</b>	ħada:g	‘to fish’
i. hilag	<b>ħa:lig</b>	ħila:gə	‘to shave’
j. ti-rajjaḡ	<b>mitrajjiḡ</b>	-----	‘to have breakfast’
k. wa:fag	<b>mwa:fig</b>	mwa:figə	‘to agree’
l. farrag	<b>mfarrig</b>	<b>tafri:g</b>	‘to cause to separate’

Generally, the active participle in QA, as in Classical Arabic, indicates “a temporary, transitory or accidental action or state of being” (Wright, 1967, vol. 1, p. 131-132), and it “signifies the doer of an action” (Azami, 1988, p. 245). However, in QA, the active participle may be inflected only for gender and number, as illustrated in (25), whereas in CA, it is also inflected for case.

- (25) a. ħa:lig                      ‘to shave (sg.m.)’  
       b. ħa:lg-ə                ‘to shave (sg. f.)’  
       c. ħa:lg-i:n              ‘to shave (pl.)’

The verbal nouns, on the other hand, “are abstract substantives, which express the action, passion, or state indicated by the corresponding verbs, without any reference to object, subject, or time” (Wright, 1967, vol. 1, p. 110).

Although participles and verbal nouns are generally classified with nouns/adjectives and nouns, respectively, they are treated as verbs in certain contexts, as illustrated in (26) and (27) below. Wright explains: “The nomina agentis or participles, which hold a middle position between the verb and the noun, and partake of the force of both, may, like the

nomina verbi, follow the government either of the verb or the noun, or both” (Wright 1967 vol.2, p. 63). In fact, the active participle is usually used as a verb in QA. Passive participles are also treated as verbs in certain contexts (Wright, 1967, vol.2, p. 69). But since these may only adopt the template [ma-CCuuC] or [m-CaCCaC], which does not include the context triggering affrication according to the analysis proposed here, the passive participles are not discussed. In CA, however, the class of nouns/adjectives that may behave like verbs is larger (Wright, 1967, vol. 2; Al-hāshemī, 2000, p, 239-265).

(26) Active participles

i. Perfective:

a. Ali ḥa:liḡ ʃaʕr-a.

Ali shaved hair-3sg.m.

‘Ali has shaved his hair’

ii. Imperfective:

a. il-walad ḡa:ʕid f il-be:t.

the-boy sat in the-house

‘The boy is sitting in the house’

b. ma:n-i: ḥa:liḡ ʃaʕr-i:.

not-1sg. shaving hair-1sg.

‘I am not going to shave my hair’

(27) Verbal nouns

a. ʔashal ʃaj taʕli:ḡ is-sata:ʒir.

easier thing hanging the-curtains

‘the easiest thing (to do is) hanging the curtains’

b. ḡil-t l-ah: it-taʕri:ḡ be:n il-na:s mu: ze:n.

told-1sg. to-3sg.m. the-separation between the-people not good

‘I told him: to cause people to separate (from each other) is not good’

It is worth mentioning that the verbal nouns in contexts such as those above can be

substituted by the construction [ʔan + present] which is one of the conditions for verbal nouns to function as verbs in CA (Al-hāšemī, 2000, 242). Also, [ʔan + present] is one of the constructions of the subjunctive mood in Arabic (Wright, 1967, Vol.2, p. 24), and if the verbal noun could be used in the same context, it follows that the latter may be one of the constructions of the subjunctive mood as well. This, at least, seems to be the case in QA.

Therefore, I conclude that the reason for the blockage of affrication in these two classes of words is that in QA the active participles and the verbal nouns may function as verbs which entails that they should be subject to the same OP (Optimal Paradigms faithfulness) constraint as verbs. Hence, I suggest including the participles and the verbal nouns in the inflectional paradigms of their corresponding verbs. This prevents affrication from applying in these forms, as in the verbal forms in tableaux (11-14).

The motivation for treating verbal inflectional paradigms differently from other lexical classes in QA could be found in the field of acquisition. Any verbal inflectional paradigm may include as many as nineteen members, in addition to the active and passive participles and verbal nouns, whereas the members of nominal and adjectival paradigms do not exceed four for nouns and five for adjectives (see also McCarthy, 2005). It could be more difficult for the learner to acquire larger paradigms if they contain some members that exhibit alternations, and other members that do not. Hence, to facilitate the acquisition process, the grammar of QA chooses to block affrication in order to keep unity among the members of verbal paradigms.

The distinction that the grammar of QA makes between verbs (including participles and verbal nouns) and other lexical classes with respect to affrication is not unattested. Many phonological processes distinguish between different lexical classes in different languages. For example, Smith (1997, p. 2) argues that the category of nouns exhibits a “privileged phonological behavior” and shows phonological contrast more than any other category, such as verbs and adjectives, due to domain-specific faithfulness constraints. She bases her argument on the patterns observed in the distribution of accent among different lexical classes in different dialects of Japanese. Smith (1997, p. 11) also mentions that nouns display richer phonological contrast than verbs in other languages such as English and Spanish (stress patterns), Arabic (verbs must be templatic but not nouns), and many Bantu languages (only nouns may start with NC clusters).

Also, according to Benua (1997, p. 25), morpheme-specific or class-specific phonological behavior may be the outcome of different OO-correspondence constraints governing these classes. She draws examples from English affixal morphemes, diminutive and distributive reduplication in Lushootseed, and imperative truncation and jussive/2fs truncation in Tiberian Hebrew. In Moroccan Arabic, McCarthy (2005) shows that monosyllabic triconsonantal nouns may either take the form CəCC or CCəC, but similar verbs invariably take the form CCəC due to a highly ranked OP-correspondence constraint in verbs.

In the current study, however, nouns and adjectives form a category that exhibits more alternation than verbs due to a faithfulness constraint that is operative only in verbal paradigms (Optimal Paradigm-faithfulness).

### **3.6 Emphasis spread and affrication**

#### *3.6.1 Domain and direction*

As reported in many studies, emphatic, pharyngealized, or uvularized consonants have two points of articulation. The primary point of articulation occurs in the anterior part of the vocal tract (for Arabic emphatics). The secondary point of articulation consists of a constriction in the upper pharynx (Ali & Daniloff, 1972; Ghazeli, 1977; Bukshaisha, 1985; Davis, 1995; Zawaydeh, 1999; among others). Emphatic consonants have a co-articulation effect on neighboring segments that can be defined as spreading of the feature [+RTR] (retracted tongue root) from the emphatic consonant to all the consonants and vowels in its domain. This results in a retraction in the place of articulation of the consonants occurring in the scope of emphatics, and a retraction/lowering in the place of articulations of the vowels. The process is bi-directional. But the strength of propagation in each direction, the scope of emphasis, and the blocking segments, if any, may vary from one variety to another.

For example, in a study on Iraqi Arabic, Ali and Daniloff (1972, p. 102-103) find that the syllable structure is the determiner of the scope of emphasis. They write, “emphasis can spread over two open syllables in multi-syllabic words.....while it fails to spread over a mono-syllabic word of the type CVCC”. Ghazeli (1977, p. 90-109) reports that in Tunisian Arabic, whether the propagation is leftward or rightward, the entire word is the scope of emphasis. And although the backing effect induced by this process on neighboring segments

may be slightly affected by the distance from the emphatic consonants and the duration of an intervening palatal vowel, if one is present, these factors cannot block the spread of emphasis. He also finds that rightward emphasis spread is slightly weaker than leftward emphasis spread. Davis (1995, p. 474) suggests that in a southern Palestinian dialect emphasis spread can extend over the entire word when it propagates from right to left. But when the propagation is in the opposite direction it is blocked by the high front segments [i], [j], [ʃ], and [dʒ]. In a northern Palestinian dialect, left to right propagation is also blocked but this time by the segments [ʃ], [j], [w], [i], and [u]. The same situation holds for Syrian Arabic except that the blocking segments are [j], [w], [ʃ] and [ɑ] (Adra, 1999, p. 180-182). Based on her EPG and acoustic studies, Bukshaisha (1985, p. 211 & 273) proposes that the scope of emphasis in QA extends up to 6 segments or 600 msec “regardless of the quality of neighbouring segments”. This propagation of emphasis is bi-directional and it is not blocked by word, syllable, or morpheme boundaries. For Gulf Arabic in general, Hussain (1985) obtains a result similar to Bukshaisha’s with respect to leftward emphasis spread. However, Hussain (1985, p. 295) finds that the front high long vowel /i:/ “does not acquire the backing gesture of the preceding emphatic consonants” in rightward emphasis spread in the monosyllabic words that he tested. Further, he finds that in this context, /i:/ “blocks the spreading of the emphatic gesture” (Hussain, 1985, p. 305).<sup>16</sup>

The discrepancy between studies in the treatment of /i:/ and emphasis results from a difference in their definition of retraction. Bukshaisha (1985) considers a vowel to be affected by emphasis spread if the onset of its F2 is lowered in rightward emphasis spread, and if the offset of its F2 is lowered in leftward emphasis spread. However, Hussain (1985, p. 295) relies on the value of F2 in the steady-state portion of the vowel to determine whether this vowel is retracted or not.

As a matter of fact, when not in isolation, the formant frequencies of the onsets and offsets of vowels are always affected by adjacent segments. The difference between the formant frequencies of the onsets and offsets of vowels in isolation and those of the vowels adjacent to other segments is a natural result of co-articulation. Therefore, the formant

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<sup>16</sup> According to Hussain (1985), /i/ gets only retracted, yielding, [i]. However, whether /i/ only retracts, yielding [i], or retracts and lowers, yielding [ə], has no bearing on the analysis adopted here.



frequencies of the onset of a vowel that is preceded by an emphatic segment, and the formant frequencies of the offset of a vowel that is followed by an emphatic segment, should not be used to determine whether the vowel is affected by the spread of emphasis of the adjacent emphatic. However, in Bukshaisha's study, in addition to the fact that the F2 of the onsets and offsets of vowels is taken to determine whether a vowel is retracted or not, all of the items in which /i:/ is found to be affected by rightward emphasis spread involve a context in which the emphatic segment is adjacent to /i:/. The only exception is the first item in the pair /tʰibɑːʃi:r//tibaːʃi:r/, in which /i:/ occurs between /ʃ/ and /r/. For this pair, Bukshaisha says:

It is evident that /i/ is pharyngealized in the emphatic context as its F2 value drops from 1700 Hz [in the non-emphatic context] to 1000 Hz [in the emphatic context]. /i:/ has a higher F2 onset and a short steady state at 1900 Hz before it falls in a long transition to 1150 Hz before /r/. /r/ also exhibits a slight lowering of its F2 value in the emphatic environment, indicating that it is affected by pharyngealization even though it is 6 segments away from /tʰ/.<sup>17</sup> Also /i:/ ends in a slightly lower value before /r/ in the emphatic context than before /r/ in the non-emphatic context. Here the palato-alveolar sound /ʃ/ did not block the spread of emphasis although it did not acquire it, as it has kept the onset and offset of F2 value of the adjacent vowels /a:/ and /i:/ high (p. 260).

It appears that the long transition and the low F2 of the offset of /i:/ preceding /r/ (1150 Hz) are taken as an indication that the vowel is affected by rightward emphasis spread. As a matter of fact, /r/ is reported to be contextually emphatic in many varieties of Arabic (Cantineau, 1936, 1937; Ghazeli, 1977, p. 171; Al-Sulaiti, 1993). In QA, one of the contexts in which /r/ surfaces emphatic is in the scope of underlyingly emphatic segments (Bukshaisha, 1985). However, the emphasis of /r/ is weak and it affects only adjacent segments, according to Cantineau (1936, 1937), and only tautosyllabic segments according to Ghazeli (1977, p. 169). If this is correct then the emphasis of /r/ in this word could be a result of a long-distance agreement between /tʰ/ and /r/, in the feature [+RTR], and that it may be independent of the preceding segments. In other words, /i:/ does not acquire emphasis from /tʰ/, but rather from /r/. This is supported by the fact that F2 at the offset of

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<sup>17</sup> /tʰ/ is /tʰ/.

/i:/ is dramatically lower (1150 Hz) than at its onset or even at its steady-state, which remains relatively high (1900 Hz).

Another issue concerns the voiceless palatal fricative /ç/. Bukshaisha (1985, p. 260) reports that this sound keeps the F2 of the offsets and onsets of the vowels preceding and following it high. Nevertheless, she does not consider it a blocker of the spread of emphasis. At the same time, she considers the lower F2 of the onsets and offsets of the vowels (and some consonants) preceding and following underlyingly emphatic segments an indication that these vowels have acquired the emphatic gesture. In other words, if [ç] is not to be taken as a blocker of emphasis spread, although it keeps the offset and onset of the F2 of its adjacent vowels high, then the low onsets and offsets of vowels adjacent to emphatics should not necessarily be taken as an indication of the spread of emphasis to these vowels. It is worth mentioning that /ç/ is found to block the propagation of emphasis in many varieties of Arabic. These include a southern and a northern Palestinian variety (Davis, 1995, p. 474; McCarthy, 1997) and a Syrian variety investigated by Adra (1999, p. 180-182).

In any case, it seems that with respect to whether or not /i:/ is retracted in rightward emphasis in QA, conclusions cannot be drawn based on words such as [tʰibɑ:çi:r] since the vowel in this word occurs in an ambiguous context, and definitely not on words in which the underlyingly emphatic segment occurs adjacent to /i:/, if the value of F2 in the vicinity of that segment is taken as an indication of whether /i:/ is affected by emphasis spread or not.

For these reasons, with respect to the characterization of /i:/ in the context of emphatics, I will rely on the results obtained by Hussain (1985). However, with respect to pharyngealization/emphasis spread, in general, the findings of Bukshaisha (1985) and that of Hussain (1985) are considered to hold true for QA, since they resemble each other.

### 3.6.2 *The spread of emphasis and affrication in QA*

The interaction between emphasis spread and affrication is observed in previous studies. For example, Cantineau (1936, 1937) refers to emphasis as a blocker of affrication<sup>18</sup> in some Arabic varieties of the Levant. Johnstone (1978, p. 292) points to the fact that the front

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<sup>18</sup> Cantineau distinguishes between two surface representations of /k/ and /g/; plain [k] and [g] and emphatic ones, which are the emphatics he refers to in this context.

vowels /a/ and /a:/ turn into back vowels in the neighborhood of emphatic consonants, implying that affrication may not apply in these contexts. Maṭar (1985, p. 148) reports that [g] does not undergo affrication in the neighborhood of emphatic/*mufaxxama* segments. Further, it has been indicated in the literature that emphatic consonants block affrication in certain words, but not in others (Maṭar, 1969; Johnstone, 1978). However, none of the previous studies provide an adequate account for this problem.

The process of emphasis spread has a strong effect on affrication in QA, in which the class of underlyingly emphatic consonants are /t<sup>ʕ</sup>, s<sup>ʕ</sup>, ḏ<sup>ʕ</sup>, l<sup>ʕ</sup>/ (Bukshaisha, 1985; Al-Sulaiti, 1993). Affrication is blocked in the scope of these emphatics. However, there are some cases in which affrication applies in words containing emphatic segments. I find that the existence of items that undergo affrication in spite of containing emphatic segments is related to limits on the scope and direction of emphasis spread and the position that [k]/[g] occupies in a word with respect to the emphatic segment. The factor determining whether or not affrication is blocked in words containing emphatics is the surface realization of the high front vowel adjacent to /g/, as illustrated in (28).<sup>19</sup>

(28)	a. /girt <sup>ʕ</sup> ɑ:s/	[gərt <sup>ʕ</sup> ɑ:s]/[*dʒərt <sup>ʕ</sup> ɑ:s]	‘paper’
	b. /gis <sup>ʕ</sup> i:d/	[gəs <sup>ʕ</sup> i:d]/[*dʒəs <sup>ʕ</sup> i:d]	‘poetry’
	c. /nigil <sup>ʕ</sup> /	[nəgəl <sup>ʕ</sup> ]/[*nədʒəl <sup>ʕ</sup> ]	‘cotton’
	d. /gis <sup>ʕ</sup> i:r/	[gəs <sup>ʕ</sup> i:r]/[*dʒəs <sup>ʕ</sup> i:r]	‘short’
	e. /gifas <sup>ʕ</sup> /	[gəfas <sup>ʕ</sup> ]/[*dʒəfas <sup>ʕ</sup> ]	‘cage’
	f. /t <sup>ʕ</sup> ɑ:big/	[t <sup>ʕ</sup> ɑ:bəg]/[*t <sup>ʕ</sup> ɑ:bədʒ]	‘story, floor’
	g. /t <sup>ʕ</sup> ɑ:lig/	[t <sup>ʕ</sup> ɑ:ləg]/[*t <sup>ʕ</sup> ɑ:lədʒ]	‘divorced’
	h. /s <sup>ʕ</sup> ana:dig/	[s <sup>ʕ</sup> ana:dəg]/[*s <sup>ʕ</sup> ana:dədʒ]	‘huts’
	but:		

<sup>19</sup> Similar contexts including /k/ were not found, except in /ḏ<sup>ʕ</sup>iħik/ ‘laughing, to laugh’, in which affrication is blocked by MAX-OP(dorsal), since it is a verbal noun.

i. /t <sup>ʕ</sup> iri:g/	[t <sup>ʕ</sup> əri:g]/[t <sup>ʕ</sup> əri:dʒ]	‘road’
j. /s <sup>ʕ</sup> idi:g/	[s <sup>ʕ</sup> ədi:g]/[s <sup>ʕ</sup> ədi:dʒ]	‘a friend’

The examples given above show that in words containing emphatics, affrication is blocked when /g/ occurs adjacent to short /i/, whether the underlyingly emphatic segment is to the right or left side of /i/ (28a-h). In these contexts /i/ always surfaces retracted/lowered, yielding [ə] (Bukshaisha, 1985) or [i] (Hussain, 1985). Therefore, the phonetic conditioning of affrication is not met and consequently, the process does not apply. However, when the vowel adjacent to /g/ is a long /i:/, affrication applies only when /i:/ occurs to the right side of the emphatic segment.<sup>20</sup> This is the same context in which /i:/ does not acquire the emphatic gesture (Hussain, 1985), as shown in (28i-j). The distinction between the words that may optionally undergo affrication and those that may not is based on limits on the scope and direction of emphasis spread and the position that /g/ occupies in a word, with respect to the emphatic segment.

The restriction that emphasis spread imposes on this process indicates that affrication is a surface phenomenon, as predicted by OT. All of the items in (28) meet the condition of affrication in the underlying representation. However, only those that meet the condition of affrication at the surface level are able to undergo the process.

To account for the distribution of [g] and its affricate variant in emphatic contexts, I propose the constraints given below, which are inspired by the discussions in Davis (1995) and the constraints suggested in McCarthy (1997) in their analyses of the patterns of emphasis spread in a southern Palestinian variety. In that variety, the scope and direction of emphasis spread seems to be identical to that in QA with one exception. In the Palestinian variety, the blocking segments in the rightward emphasis spread are /i:, j, ʃ, dʒ/ (p. 232), whereas in QA, it appears that only the long vowel /i:/ is resistant to emphasis spread. These constraints are given in (29), (30), (31), and (32), (33), and ranked according to (34).

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<sup>20</sup> Actual examples including the opposite context, that is, forms in which /i:/ is preceded by /k/ or /g/ and followed by an emphatic, were not found.

- (29) Faithfulness: MAX-IO(+RTR)  
Every [+RTR] specification in the input is present in the output.
- (30) Faithfulness: DEP-IO(+RTR)  
Every [+RTR] specification in the output is present in the input.
- (31) Faithfulness: DEP-IO(+RTR)/[i:]  
Do not insert a [+RTR] specification to an input [i:].
- (32) Markedness: +RTR-LEFT  
Align([+RTR], Left, Word, Left)  
In words containing one of the segments [t<sup>ɛ</sup>, s<sup>ɛ</sup>, ʔ<sup>ɛ</sup>, l<sup>ɛ</sup>], a [+RTR] feature is aligned with the left edge of the word.
- (33) Markedness: +RTR-RIGHT  
Align([+RTR], Right, Word, Right)  
In words containing one of the segments [t<sup>ɛ</sup>, s<sup>ɛ</sup>, ʔ<sup>ɛ</sup>, l<sup>ɛ</sup>], a [+RTR] feature is aligned with the right edge of the word.
- (34) MAX-IO(+RTR) » +RTR-LEFT, DEP-IO(+RTR)/[i:] » +RTR-RIGHT, [tʃ]/[dʒ] <--> [i(:)] » DEP-IO (+RTR) » [k]/[g]<--> [i(:)]<sub>stem</sub>, MAX-IO (dorsal)

The constraint given in (29) requires that segments that are underlyingly emphatic remain so in the output. Constraint (30) penalizes structures that acquire emphasis at the surface level. The faithfulness constraint given in (31) prevents /i:/ from surfacing retracted/lowered.<sup>21</sup>

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<sup>21</sup> To account for the fact that front/high segments block emphasis spread, McCarthy (1997) proposes the constraint RTR/HI&FR: RTR segments cannot be both high and front, which is problematic since when /i:/ surfaces [+RTR], it is no longer HI&FR since it surfaces as [ɛ:]. So if /i:/ is affected by emphasis spread, it is no longer [i:] and the constraint is vacuously satisfied. In other words, McCarthy's constraint bans a [+RTR] [i:] on the surface but it does not prevent an input /i:/ from surfacing lowered and/or retracted. What we need is a constraint preventing that.

Constraints (32) and (33) require the spread of emphasis to be aligned with the left and right edges of the word, respectively, in case the word includes one of the underlyingly emphatic segments [tʰ, sʰ, ɖʰ, lʰ]. It is important to note that although the points of articulation of consonants occurring in the vicinity of emphatics are retracted compared to their usual points of production, these consonants do not become emphatic.<sup>22</sup> The interaction among these constraints, together with the basic constraints of affrication, is shown in tableau (15), which exemplifies affrication blockage in (28b).

Tableau (15)<sup>23</sup>

Constraint ranking: MAX-IO(+RTR) » +RTR-LEFT, DEP-IO(+RTR)/[i:] » +RTR-RIGHT, [tʃ]/[dʒ] <--> [i(:)] » DEP-IO (+RTR) » [k]/[g]<-->¬ [i(:)]<sub>Stem</sub>, MAX-IO (dorsal)

/gisʰi:d/	MAX-IO (+RTR)	+RTR-LEFT	DEP-IO (+RTR)/ [i:]	+RTR-RIGHT	[tʃ]/[dʒ] <--> [i(:)]	DEP-IO (+RTR)	[k]/[g] <--> ¬ [i(:)] <sub>s</sub>	MAX-IO (dorsal)
a. <u>g</u> ʰ <u>ə</u> sʰi:d				**		**		
b. <u>dʒ</u> ʰ <u>ə</u> sʰi:d				**	*!	**		*
c. <u>g</u> iʰ <u>s</u> i:d		*!*		**			*	
d. <u>dʒ</u> iʰ <u>s</u> i:d		*!*		**				*
e. <u>g</u> ʰ <u>ə</u> sʰ <u>ə</u> :d			*!			****		
f. <u>dʒ</u> ʰ <u>ə</u> sʰ <u>ə</u> :d			*!		*	****		*
g. <u>g</u> iʰ <u>s</u> ʰ <u>ə</u> :d		*!*	*			**	*	
h. <u>dʒ</u> iʰ <u>s</u> ʰ <u>ə</u> :d		*!*	*			**		*
i. <u>g</u> iʰ <u>s</u> i:d	*!							

In tableau (15), candidates (c), (d), (g) and (h) are ruled out by violating the undominated +RTR-LEFT. Candidates (e) and (f) are ruled out by violating DEP-IO(+RTR)/[i:]. Candidate (i) is ruled out by violating the dominating constraint MAX-IO(+RTR). Candidates (a) and (b) incur the same number of violations to +RTR-RIGHT and DEP-IO(+RTR), but by violating the constraint [tʃ]/[dʒ] <--> [i(:)], candidate (b) is ruled out and

<sup>22</sup> Except for contextually emphatic consonants, discussed in §2.1. Also the sibilant [s] surfaces emphatic in the vicinity of /tʰ/ in leftward propagation (Al-Sulaiti, 1993, p. 160).

<sup>23</sup> Underlined segments are those affected by the spread of emphasis, that is [+RTR].

candidate (a) becomes optimal.

The same constraints can allow the desired variation in items such as (28i-k), as shown in tableau (16), except that in this case, +RTR-LEFT is irrelevant. Therefore it is eliminated from this tableau.

Tableau (16)

Constraint ranking: MAX-IO(+RTR) » DEP-IO(+RTR)/[i:] » +RTR-RIGHT, [tʃ]/[dʒ] <-->

[i(:)] » DEP-IO (+RTR) » [k]/[g]<-->¬ [i(:)]<sub>Stem</sub>, MAX-IO (dorsal)

/sʕdi:g/	MAX-IO (+RTR)	DEP-IO (+RTR)/ [i:]	+RTR- RIGHT	[tʃ]/[dʒ] <--> [i(:)]	DEP- IO (+RTR)	[k]/[g] <-->¬ [i(:)] <sub>Stem</sub>	MAX- IO (dorsal)
a. sʕdi:g			**		**	*	
b. sʕdi:dʒ			**		**		*
c. sʕidʕ:g		*!	**		**		
d. sʕidi:g			*!****			*	
e. sʕidi:dʒ			*!****				*
f. sʕdʕ:g		*!			****		
g. sʕdʕ:dʒ		*!		*	****		*
h. sʕidi:g	*!		****			*	

In tableau (16), candidate (h) is ruled out by violating the dominating constraint MAX-IO(+RTR). Candidates (c), (f) and (g) are ruled out by violating the faithfulness constraint DEP-IO(+RTR)/[i:]. Candidates (d) and (e) are ruled out by incurring too many violations to the markedness constraint +RTR-RIGHT. Both candidates (a) and (b) become optimal since they incur an equal number of violations to +RTR-RIGHT and DEP-IO(+RTR), and to the equally ranked constraints »[k]/[g]<-->¬ [i(:)]<sub>Stem</sub> and MAX-IO (dorsal).

The fact that affrication is blocked when co-occurring with emphatics is relevant to the question raised in Zawaydeh (1999) as to whether emphasis spread is a phonological or a phonetic process. Zawaydeh (p. 173) argues that emphasis spread is a phonetic process, not phonological, based on her finding that the process is not blocked by any segment, and that it does not interact with other phonological processes. This argument could be valid for the variety she investigated (Ammani-Jordanian), but not for other varieties of Arabic. As far as

QA is concerned, it can be argued that emphasis spread is a phonological process, since it is blocked by the long high front vowel [i:] in rightward propagation, and since it interacts with affrication, which *is* a phonological process.

Another context in which the vowel /i/ is retracted in QA is when it is adjacent to the emphatic variant of /r/, as discussed in the following section.

### 3.6.3 Contextually emphatic /r/ and affrication

Bukshaisha (1985) proposes that in QA, the segments /b, f, m, n, r, l/ surface emphatic in the scope of underlyingly emphatic segments. However, her study includes data in which an emphatic variant of /r/ surfaces when preceded by [a] or [ɑ:], as given in (33a-c).<sup>24</sup> Additional data from Al-Sulaiti (1993, p. 158, p. 231) indicate that the back variant of /r/ surfaces when preceded by [ɑ:] as well as [u:], as exemplified in (33d-e). Hussain (1985, p. 17) summarizes the contexts in which an emphatic variant of /r/ surfaces in GA (which includes QA) as follows, “when /r/ is adjacent to segments involving posterior articulation such as pharyngeal consonants, uvular consonants, emphatic consonants, and low vowels, it is rendered back [ɾ]”. Unlike underlying emphatics, contextually emphatic segments retract the place of articulation of adjacent vowels only (Cantineau, 1936), or tautosyllabic vowels (Ghazeli, 1977).

As a result of being preceded by [r<sup>h</sup>], the feminine ending morpheme /-i/ surfaces as [ɐ], which surfaces following [+back] segments (see §3.4.1), as demonstrated in (35a-e).

- (35) a. /mar-i/      mar<sup>h</sup>ɐ      ‘a woman’  
       b. /stma:r-i/    stimɑ:r<sup>h</sup>ɐ      ‘a form’

<sup>24</sup> It is important to note that Bukshaisha’s transcription of /r/ in these items does not show emphasis. However, the fact that /r/ surfaces emphatic in these items can be concluded from the representation of the feminine morpheme, which appears in her transcription as a low vowel (/a/ > [ɐ]), which is the allomorph that attaches to emphatics (Al-Sulaiti, 1993), in addition to the other dorso-pharyngeal segments. Otherwise, the feminine morpheme is represented as /i/ (/i/ > [ɜ]); e.g. /ħadʒdʒ-i/ ‘one pilgrimage’ (Bukshaisha, 1985, p. 22, p.27, p. 33; see also, footnote 10, above).

With respect to the long vowel [ɑ:], Bukshaisha (1985) considers it to be underlyingly /a:/, although it always surfaces as a back vowel. Al-Sulaiti (1993, p. 138-139) suggests that /a:/ is a back vowel.



c. /stʔa:r-i/	stiʔa:r <sup>ʕ</sup> ʔ	‘borrowing’
d. /sajja:r-i/	sajja:r <sup>ʕ</sup> ʔ	‘car’
e. /ku:r-i/	ku:r <sup>ʕ</sup> ʔ	‘a ball’
f. /kirsi:/	kir <sup>ʕ</sup> si:	‘chair’
g. /kirfa:ji/	kir <sup>ʕ</sup> fa:jɜ	‘bed’
h. /girgifa:n/	gir <sup>ʕ</sup> gif <sup>ʕ</sup> a:n <sup>25</sup>	‘a kind of fish’

An additional context in which an emphatic variant of /r/ surfaces is in a coda position, preceded by the short vowel /i/, as indicated in (35f-h). Other items in which [r<sup>ʕ</sup>] surfaces include /sirr/ ‘secret’, /dʒirr/ ‘you pull’ and /firr/ ‘you throw’, which surface as [sir<sup>ʕ</sup>r<sup>ʕ</sup>], [dʒir<sup>ʕ</sup>r<sup>ʕ</sup>] and [fir<sup>ʕ</sup>r<sup>ʕ</sup>]. Consequently, the short /i/ retracts and surfaces as [i]. This could be related to Shahin’s (1997, 217) finding, which is experimentally based, that short vowels in general become RTR in closed syllables in a Palestinian variety, no matter what segment occurs in the coda of that syllable. In QA however, it seems that this property is restricted to syllables that end in /ir\$/. In the same syllable position, preceded by the vowels [a, a:, u, u:, o:], the emphatic variant of /r/ is independently enforced by virtue of it being adjacent to a segment that is back or low (see above). [i:] on the other hand, is not expected to acquire the emphasis of [r<sup>ʕ</sup>], since it does not acquire it from the underlyingly emphatic segments whose scope of emphasis exceeds that of [r<sup>ʕ</sup>].

It is important to consider that due to its phonetic implementation, [r] is generally a unique segment. With respect to emphasis, [r] is unique due to the fact that it sometimes surfaces emphatic in a wider range of contexts than the other contextually emphatic segments (Ghazeli, 1977; Hussain, 1985; Younis, 1994), which are in QA /b, f, m, n, l/ (Bukshaisha, 1985; Al-Sulaiti, 1993).<sup>26</sup> In any case, it can be concluded that if /r/ surfaces

<sup>25</sup> The retraction/lowering of the vowel preceding [f] is probably due to the emphasis of [f], triggered by the following back vowel.

<sup>26</sup> Bukshaisha adds /t/ to this class, and provides the following examples: /t-ð<sup>ʕ</sup>ir/ and /s<sup>ʕ</sup>o:t/. Al-Sulaiti (1993, p. 154), however, argues that initial and word final /t/ assimilates to any following coronal obstruent, including emphatics, which are all coronal in Arabic.

emphatic, it retracts the place of articulation of /i/, leading to affrication blockage in (35f-h). The requirement that a coda /r/ be emphatic is formalized as a markedness constraint, which is given in (36).

- (36) a. Coda[r]+RTR  
       [r] surfaces as [+RTR] in coda position.  
       b. MAX-IO(+RTR) » Coda[r]+RTR, +RTR-LEFT » +RTR-RIGHT, [tʃ]/[dʒ] <-->  
       [i(:)] » DEP-IO(+RTR) » [k]/[g] <--> ¬ [i(:)]<sub>Stem</sub>, MAX-IO (dorsal)

The interactions among this constraint, the basic constraints of affrication, and those inducing emphasis spread, are represented in tableau (17). Notice that the scope of the emphasis of [r<sup>ʕ</sup>] is restricted to adjacent segments, unlike that of the underlying emphatics, whose spreading domain is enforced by the alignment constraints in (32) and (33). This distinction motivates proposing the constraint given in (37), which requires segments adjacent to an emphatic to surface emphatic/retracted.

- (37) a. AGREE-(r, +RTR)  
       A segment adjacent to a [+RTR] [r] is also [+RTR].  
       b. Coda[r]+RTR, AGREE-(r, +RTR), +RTR-LEFT » +RTR-RIGHT, DEP-IO(+RTR),  
       [tʃ]/[dʒ] <--> [i(:)] » [k]/[g] <--> ¬ [i(:)]<sub>Stem</sub>, MAX-IO (dorsal)

Tableau (17)

Constraint ranking: Coda[r]+RTR, AGREE-(r,+RTR), +RTR-LEFT » +RTR-RIGHT, [tʃ]/[dʒ] <--> [i(:)] » DEP-IO(+RTR) » [k]/[g] <--> [i(:)]<sub>stem</sub>, MAX-IO (dorsal)

/kirsi:/	Coda[r] +RTR	AGREE- (r,+RTR)	+RTR- LEFT	+RTR- RIGHT	[tʃ]/[dʒ] <--> [i(:)]	DEP-IO (+RTR)	[k]/[g] <--> [i(:)] <sub>s</sub>	MAX-IO (dorsal)
a. <sup>◌̤</sup> kir <sup>◌̤</sup> si:						***		
b. kir <sup>◌̤</sup> si:		*!*				*	*	
c. kirsi:	*!						*	
d. tʃirsi:	*!							*
e. tʃir <sup>◌̤</sup> si:					*!	***		*

Candidate (b) is ruled out by violating the highly ranked constraint AGREE-(r,+RTR) and candidates (c) and (d) are ruled out by violating the undominated markedness constraint Coda[r]+RTR. Candidates (a) and (e) tie on the faithfulness constraint DEP-IO(+RTR) but since candidate (e) violates the markedness constraint [tʃ]/[dʒ] <--> [i(:)], (a) is optimal. Notice that the alignment constraints +RTR-LEFT and +RTR-RIGHT are irrelevant since they are only applicable to words including underlying emphatic segments, not [r], which is only contextually so.

To sum up, [r<sup>◌̤</sup>] retracts/lowers a preceding /i/ in the structure /ir\$/ , which in turn blocks affrication in the onset of that syllable. The emphatic variant of /r/ is conditioned by adjacency to back or low segments, by occurring in the scope of emphasis of an underlying emphatic segment, or by being in a coda position preceded by /i/. The full range of contexts in which the contextually emphatic segments, including /r/, surface emphatic in QA and in other varieties of Arabic has yet to be further investigated. This issue is left for future research.

### 3.7 The OCP-Place restrictions and affrication

OCP is a formal restriction on the co-occurrence of certain features/elements within a certain domain. It was first suggested to account for restrictions on the distribution of different tones (Leben, 1973; Goldsmith, 1976). Later on, the constraint was suggested to be responsible for different kinds of restrictions on the co-occurrences of segmental features (McCarthy, 1986).

Different phonological process are triggered or blocked by the activity of this constraint (McCarthy, 1986; Yip, 1988), which is given in (38).

(38) Obligatory Contour Principle (OCP):

“At the melodic level, adjacent identical elements are prohibited.”

With respect to Arabic and other Semitic languages, it has been argued that segmental OCP-Place restricts the co-occurrence of homorganic segments in consonantal roots (McCarthy, 1988, 1993, 1994, p. 202). However, Frisch, Pierrehumbert and Broe (2004) find that OCP-Place in Arabic is not absolute, but gradient. The more features shared between a pair of consonants, the stronger the restriction on their co-occurrence. Further, they suggest that distance plays a role in OCP since the restriction is stronger on adjacent consonants as compared to non-adjacent ones, everything else being equal (also, Suzuki, 1998). In addition, based on the results obtained from a psycholinguistic experiment, Frisch and Zawaydeh (2001) propose that OCP-Place is a *synchronically* active constraint in the grammar of native speakers of Arabic. They found that Jordanian speakers rejected non-words that violate OCP-Place more than non-words that do not violate this constraint.

If OCP-Place is an active synchronic constraint in the grammar of native speakers of Arabic, it follows that the effect of this constraint should be observed in phonological processes that involve segmental alternations, such as affrication. This result is exactly what is observed in a number of items in which affrication is inhibited although its phonetic conditioning is met, as given below.

- |      |            |           |                |
|------|------------|-----------|----------------|
| (39) | a. kiʃʃa   | *tʃiʃʃa   | ‘messy hair’   |
|      | b. giʃir   | *dʒiʃir   | ‘peel’         |
|      | c. giʃba:r | *dʒiʃba:r | ‘wood chips’   |
|      | d. ʃaʃi:g  | *ʃaʃi:dʒ  | ‘loved one’    |
| (40) | a. ti:k    | *ti:tʃ    | ‘teak wood’    |
|      | b. kitir   | *tʃitir   | ‘corner, side’ |

c. ʕigid	*ʕidʒid	‘necklace’
d. gidlɜ	*dʒidlɜ	‘bang’
e. gidu:	*dʒidu:	‘hubble-bubble’
f. gidu:ʕ	*dʒidu:ʕ	‘food for guests’
g. digi:gʊ	*didʒi:dʒɜ	‘a minute’

Affrication is blocked when the vowel triggering the process [i(:)] is adjacent to either [ʃ],<sup>27</sup> [t] or [d]. When occurring in the close vicinity of the palatal fricative [ʃ], affrication never applies.<sup>28</sup> This is due to the high similarity of [ʃ] on the one hand, and each of [tʃ] and [dʒ] on the other. These three segments are all [-anterior] coronal obstruents. [-anterior] is a minor place feature that is argued to have an OCP effect in many languages (Padgett, 1992, p. 344).<sup>29</sup>

I argue here for the existence of a minor-place OCP constraint that is subsidiary to the coronal major place (41a). This constraint blocks affrication next to segments that are mostly similar to [tʃ] and [dʒ], that is [ʃ], as shown in (39) above.

<sup>27</sup> Affrication blockage in the vicinity of [ʃ] is found in a Palestinian variety investigated by Younes (1994, p. 220), in which the process is blocked in [kiʃri] ‘peel’ but not in [tʃibi:ri] ‘big (f.).’

<sup>28</sup> It should be noted that due to faithful IO mappings, violations of the OCP are observed. For example: /dʒe:ʃ/ > [dʒe:ʃ] ‘army’. However, such examples are merely historical residues of /dʒ/ being derived from /\*g/ (see chapter 4).

<sup>29</sup> The feature [anterior] is never suggested to have an OCP effect in Arabic. This is due to the fact that all previous studies investigated the OCP in Classical Arabic, whose phonemic inventory includes one [-anterior] coronal obstruent /ʃ/. /tʃ/ is missing from that inventory and /dʒ/ is considered to be a dorsal segment (Frisch et al., 2004, and the references therein). In addition, some of the old texts indicate that the sound represented by <d<sup>ʕ</sup>> was originally a fricative that had the same point of articulation as that of <dʒ, ʃ> (Al-Khaḥil, cited in Versteegh, 1997, p. 23; Ibn Yaʿīsh, cited in Oṣaybiʿī, 1992, p. 31, and in ʿAnīs, 1992, p. 130), but since the original pronunciation of this letter is unknown to us (ʿAnīs, 1992, p. 48-49; Fischer, 1997, p. 189) and the dominant pronunciation of it in the readings of Qurʾān is currently [d<sup>ʕ</sup>], it is considered a [+anterior, -cont] segment. Interestingly, however, if restrictions on the co-occurrence of a pair of segments depend on the degree of similarity of these segments, as suggested by Frisch et al. (2004), <d<sup>ʕ</sup>> shows an OCP pattern that conforms with a [-anterior, +cont] emphatic segment. The tables given in Mrayati (1984), which represent the co-occurrences of the Arabic phonemes with each other, in different types of roots that are extracted from a database that consists of five major classical dictionaries, show that the co-occurrence of <d<sup>ʕ</sup>> with <ʃ> is Zero. On the other hand, the percentage of the total number of co-occurrences of <d<sup>ʕ</sup>> with <d>, for instance, is 4.2% of the frequency of <d<sup>ʕ</sup>> in this database.

- (41) a. OCP: \*([ant]...[ant])<sub>coronal</sub>

A sequence of obstruents (across an intervening vowel) that do not contrast in [anterior] is prohibited within the coronal place.<sup>30</sup>

- b. \*([ant]...[ant]) » MAX-IO(dorsal), [k]/[g]<-->¬[i(:)]<sub>Stem</sub>

If it is the case that [anterior] has a subsidiary OCP effect in QA, it is predicated that affrication should be less restricted with coronal obstruents that are [+anterior], which is exactly what the data indicate, as demonstrated in (42).

- |      |            |          |                       |
|------|------------|----------|-----------------------|
| (42) | a. kiθi:r  | tʃiθi:r  | ‘plenty’              |
|      | b. ði:k    | ði:tʃ    | ‘that (f.)’           |
|      | c. kisrø   | tʃisrø   | ‘a piece’             |
|      | d. kisi:fɜ | tʃisi:fɜ | ‘bad’                 |
|      | e. kisi:rɜ | tʃisi:rɜ | ‘broken (abstractly)’ |




Having the OCP constraint \*([ant]...[ant]) highly ranked ensures that affrication does not apply next to [-anterior] segments, as demonstrated in tableau (18i). On the other hand, next to [+anterior] segments, the process applies freely since sequences of segments that contrast in their feature value for [anterior] obey the OCP constraint, as demonstrated in (18ii).

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<sup>30</sup> Rose (2000) argues for the relevance of the CVC context (consonants across an intervening vowel) in the application of the OCP. The OCP applies more forcefully to strictly adjacent consonants than to consonants across an intervening vowel; see Suzuki 1998. Strict adjacency is not relevant for the data in (39)-(40), but the distinction will be relevant in chapter 4, (20)-(21).

Tableau (18)

Constraint ranking:  $*([ant]...[ant])_{coronal} \gg \text{MAX-IO(dorsal)}, [k]/[g] \leftrightarrow \neg [i(:)]_{Stem}$

i. /giʃir/	$*([ant]...[ant])_{coronal}$	MAX-IO(dorsal)	$[k]/[g] \leftrightarrow \neg [i(:)]_{Stem}$
a.  giʃir			*
b. dʒiʃir	*!	*	
ii. /kisri/			
a.  kisr3			*
b.  tʃisr3		*	

Affrication does not apply when the vowel inducing the process  $[i(:)]$  is adjacent to  $[t]$  or  $[d]$ , as illustrated in (40), above.<sup>31</sup> This is due to the fact that the segments  $[tʃ]$ ,  $[dʒ]$ ,  $[t]$  and  $[d]$  are all  $[-cont]$  coronal obstruents.<sup>32</sup> Continuity is found to have a significant impact on the co-occurrence restrictions among the coronal obstruents in Arabic (Yip, 1989; Frisch et al., 2004). This restriction is formalized as a constraint militating against sequences that do not contrast in the feature  $[cont]$  within the coronal place, as given in (43).

(43) a. OCP:  $*([cont]...[cont])_{Coronal}$

A sequence of obstruents (across an intervening vowel) that do not contrast in  $[continuant]$  is prohibited within the coronal place.

b.  $*([cont]...[cont])_{Coronal} \gg \text{MAX-IO(dorsal)}, [k]/[g] \leftrightarrow \neg [i(:)]_{Stem}$


<sup>31</sup> The only exception is  $[digi:g]$  ‘thin’, which freely undergoes affrication. It should be considered that OCP constraints are not categorical (Frisch et al., 2004) and even when they impose static restrictions on the co-occurrence of different segments, most of these restrictions are violated in at least one form, usually more (Greenberg, 1950, Mrayati, 1984). It is also possible that  $[digi:g]$  and  $[didʒi:dʒ]$  are doublets, hence, lexically distinct (see below §3.8), and that the affricate does not surface in their plural form  $[dga:g]/[*ddʒa:dʒ]$  to avoid violation of a higher ranked OCP constraint specific to adjacent sequences of  $[d]$  and  $[dʒ]$ . There is another lexical item that surfaces as  $[didʒi:dʒ]$  ‘fishing net’, which is etymologically derived from  $/digi:g/$ . Synchronically, however, this item categorically surfaces with the affricate, therefore, must be lexicalized as such. Its plural form, on the other hand, surfaces categorically as  $[ʔadigqə]$ , which must be due to its low frequency in the variety, currently and at the time when its singular got lexicalized with the affricate.

<sup>32</sup> The feature  $[voice]$  is found to have an effect on the OCP restrictions on static patterns in Arabic (Frisch et al., 2004). The restriction on the co-occurrence of segments that agree in voicing, in addition to continuity and place, for instance, is stronger than the restriction on segments that contrast in voicing but agree in the other features. However, with respect to the interaction between the OCP and affrication, actual examples showing this pattern are not available.

Having the OCP constraint  $*([\text{cont}] \dots [\text{cont}])_{\text{Coronal}}$  dominating the faithfulness constraint MAX-IO(dorsal) and the markedness constraint  $[k]/[g] \leftrightarrow \neg [i(:)]_{\text{Stem}}$ , affrication is blocked next to the [-cont] coronals [t] and [d], as illustrated in tableau (19).

Tableau (19)

Constraint ranking:  $*([\text{cont}] \dots [\text{cont}])_{\text{Coronal}} \gg \text{MAX-IO(dorsal)}, [k]/[g] \leftrightarrow \neg [i(:)]_{\text{Stem}}$

/kitir/	$*([\text{cont}] \dots [\text{cont}])_{\text{Coronal}}$	MAX-IO(dorsal)	$[k]/[g] \leftrightarrow \neg [i(:)]_{\text{Stem}}$
a.  kitir			*
b. tʃitir	*!	*	

I argue here for the existence of a minor-place OCP constraint that is subsidiary to the coronal place and demonstrate that the restriction among the obstruents within the class of [-anterior] is stronger than that existing between [-anterior] obstruents and [+anterior] obstruents. The restriction imposed on affrication by the OCP due to agreement in [ant] or [cont] indicates that the OCP constraints are synchronically active in the grammar of QA.

### 3.8 Apparent counterexamples

#### 3.8.0 Introduction

There are cases in which the [k]/[tʃ] or [g]/[dʒ] alternations are exhibited in contexts not predicted by my analysis. These items result from the existence of doublets, not affrication. This analysis differs from the traditional position, which generally assumes that all instances of [tʃ] and [dʒ] derive from /k/ and /q/, respectively, since they occur with [k] and [q] or one of its reflexes in other varieties of Arabic, including CA/SA.<sup>33</sup>

According to Al-Yasūʿī (1996, p. 10), doublets are “synonyms that share the same template, differ only in one sound, in the same position”. Mahadin (1989, p. 1-2) considers doublets to be pairs of words that share the same meaning and form, except for one segment, which needs to occupy the same position in both words. Doublets have come to exist because of “diachronic phonological processes” or “dialect borrowing”. Al-Yasūʿī (1996, p. 10) finds that the total number of doublets in CA “exceeds 1800 pairs”. These pairs

<sup>33</sup> Except for instances of [dʒ] that derive from /dʒ/.



include many items that involve the alternation between <dʒ> and <q>, the latter being the reflex of QA /g/. Maṭar (1985, p. 154-155) also cites examples from traditional CA dictionaries that can be pronounced as either [q] (the counterpart of QA [g]) or [dʒ] without the involvement of any SYNCHRONIC phonological process. He refers to borrowing among different varieties of Old Arabic as being responsible for this situation.<sup>34</sup>

### 3.8.1 Doublets vs. affrication

There are a number of verbs in which both [k]/[g] and [tʃ]/[dʒ] may surface, as given in (44). The affricate in most of these items surfaces adjacent to the low front vowel /a/, which is not predicted according to the analysis proposed in this study. These verbs look like counterexamples to my proposal of affrication being under-applied in verbs, and blocked by adjacency to segments other than [i(:)].

(44)	a. kajjas	tʃajjas	‘to put in bag(s)’
	b. kaððab	tʃaððab	‘to lie’
	c. kattaḥ	tʃattaḥ	‘to fold arms across’
	d. gaddam	dʒaddam	‘to front’
	e. gassam	dʒassam	‘to distribut’
	f. ra:fag	ra:fadʒ	‘to accompany’
	g. fa:rag	fa:radʒ	‘to get off (s.o.) back’
	h. ʕimag	ʕimadʒ	‘to become dark’
	i. ʕitag	ʕitadʒ	‘to become old’

Upon further investigation of the data, it appears that these items do not represent cases of affrication in the category of verbs; they are only doublets, as will be explained below. Classifying the verbs given in (44) as doublets entails that the members of each pair are

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<sup>34</sup> Doublets that involve the alternation between [k] and [tʃ] cannot be found in CA since [tʃ] is missing from the inventory of this variety.

represented distinctly at the lexical level in QA. The items surfacing with [tʃ] belong to the phoneme /tʃ/, and those surfacing with /k/ belong to the phoneme /k/. Likewise, the items surfacing with [dʒ] belong to the phoneme /dʒ/, and those surfacing with [g] belong to the phoneme /g/. Following Ibn Jinni (2001, vol.1, p. 451), a prominent medieval linguist, if both forms of a doublet are equally used in different morphological derivations/inflections, I consider both to be “as<sup>f</sup>l” (base or UR).

This is not an ad hoc stipulation. In agreement with my intuition, a number of QA speakers pointed out to me that the variants with [k]/[g] in (44) are associated with Bedouins. This is not the case with those involving unambiguous affrication, such as those in (4). More importantly, the items in (44) display patterns different from those associated with the words in (4), repeated here with their corresponding verbs in (45), and which are felt to belong to the native urban variety spoken in Doha.<sup>35</sup>

(45)	Verb		Noun/Adjective
	a. kiθar	‘to increase’	kiθi:r/tʃiθi:r
	. kaθθar	‘to cause to increase’	
	b. kibar	‘to become big, old’	kibi:r/tʃibi:r
	. kabbar	‘to enlarge’	
	c. garrab	‘to become close’	giri:b/dʒiri:b
	d. ragg	‘to become thin, soft’	rigi:g/ridʒi:dʒ

<sup>35</sup> Notice that in the pairs given in (44) [k] and [tʃ] or [g] and [dʒ] appear adjacent to [a]. It may be suggested that adjacency to front [a] may also trigger affrication in some words. Examples such as (44g), however, provide evidence against such a view when emphasis is considered. In this example, the consonant that precedes the vowel adjacent to [g] and [dʒ] is /r/. This segment is reported to surface emphatic in QA in certain contexts (see §3.6.3), which include adjacency to back vowels (Hussain, 1985), as well as in the neighborhood of underlyingly emphatic segments. In (44g), /r/ is preceded by the low back vowel [ɑ:] which provides the context for its emphatic variant to surface. The emphatic variant of /r/ retracts the place of articulation of only ADJACENT vowels (Cantineau 1936) or only tautosyllabic segments, according to Ghazeli (1977, p. 169). In this case, /a/ that is adjacent to /r/ in (44g), surfaces retracted, yielding [ɑ]. This central vowel is not expected to trigger affrication, even if we assume that front [a] does, and consequently, [fɑ:radʒ] should be ruled out. But if each item in this pair has a distinct lexical entry, the verb with [dʒ] occurs freely, regardless of the adjacent segments.

. raggag	‘to make thin’	
e. tirajjag	‘to have breakfast’	ri:g/ri:dʒ
f. daggag	‘to make small’	digi:g/didʒi:dʒ
g. gal <sup>ʕ</sup> l <sup>ʕ</sup>	‘to decrease’	gili:l/dʒili:l
. gal <sup>ʕ</sup> l <sup>ʕ</sup> al	‘to decrease (causative)’	

The verbs in (45) which are derivationally related to nouns/adjectives that display true cases of affrication (third column) never surface with the affricates.

Forms that are derivationally/inflectionally related to the verbs given in (44) are treated differently from those related to items that display unambiguous cases of affrication. For example, the verbal nouns (not all of these have verbal nouns in QA), and the active and passive participles related to these verbs, exhibit the [tʃ] ~ [k] or [dʒ] ~ [g] alternations. This is not the observed pattern for the verbal nouns and participles related to forms undergoing affrication (§3.5.4). As an illustration, the active participles of the verbs in (41) are given in (46a-j). These can be compared to the active participles related to nouns/adjectives undergoing affrication (46k-q), which only surface with [k]/[g].

(46) a. mkajjis	mtʃajjis	‘to put in bag(s)’
b. mkaððib	mtʃaððib	‘to lie’
c. mkattif	mtʃattif	‘to fold one’s arms across’
d. mgaddim	mdʒaddim	‘to front’
e. mgassim	mdʒassim	‘to distribute’
f. *ga:sim	dʒa:sim	‘to divide (p.n.)’
g. mra:fig	mra:fidʒ	‘to accompany’
h. mfa:rig	mfa:ridʒ	‘to get off (s.o. back)’
i. mʁammig	mʁammidʒ	‘to darken (causative)’
j. mʕattig	mʕattidʒ	‘to be old (causative)’

## COMPARE:

k. ka:θir	*tʃa:θir	‘to become plenty’
. mkaθθir	*mtʃaθθir	‘to increase’
l. ka:bir	*tʃa:bir	‘to become big’
. mkabbir	*mtʃabbir	‘to enlarge’
m. mgarrib	*mdʒarrib	‘to make close, near’
n. mraggig	*mraddʒidʒ	‘to make thin, transparent’
o. mitrajjig	*mitrajjidʒ	‘to have breakfast’
p. mdaggig	*mdaddʒidʒ	‘to make small, thin’
q. ga:lʿlʿ	*dʒa:lʿlʿ/*dʒa:ll	‘to decrease’
. mgalʿlʿəl	*mdʒalʿlʿəl/*mdʒallil	‘to make little’

Regardless of the fact that [tʃ] and [dʒ] occur in contexts not triggering affrication in (46a-f), (46f) surfaces invariably with the affricate in QA. If this item were a case of affrication, it would be expected to surface variably with [g] and [dʒ], similar to unambiguous cases of affrication.

The items in (44) also differ from unambiguous cases of affrication when we consider the nouns/adjectives/adverbs that are related to these forms, given in (47).

(47) a. ki:s	tʃi:s		‘bag’
b. kaðbɜ	tʃaðbɜ		‘lie’
c. katif	tʃatif		‘shoulder’
d. gidɖa:m	dʒidɖa:m	jidɖa:m	‘front’
e. gismɜ	dʒismɜ		‘division, distribution’
f. *rifi:g	rifi:dʒ		‘friend’

g. *firi:g	firi:dʒ <sup>36</sup>		‘neighborhood’
h. ʁɑ:mig	ʁɑ:midʒ		‘dark’
i. ʕati:g	ʕati:dʒ		‘old (inanimate)’
COMPARE:			
j. kiθi:r	tʃiθi:r		‘many’
k. kibi:r	tʃibi:r		‘big’
l. giri:b	dʒiri:b	*jiri:b	‘close by’
m. rigi:g	ridʒi:dʒ	*riji:j	‘transparent, thin’
n. ri:g	ri:dʒ	*ri:j	‘saliva’
o. digi:g	didʒi:dʒ	*diji:j	‘thin, small’
p. gili:l	dʒili:l	*jili:l	‘small quantity’

(47d) surfaces sometimes with an initial high glide, [j], that is generally a free variant of underlying /dʒ/, yielding [jiddɑ:m]. This alternation is never exhibited in cases of unambiguous affrication of [g] (47l-p), which indicates that the affricate in (47d) is considered by native speakers to be derived from underlying /dʒ/, not /g/. In (47f) and (47g), only the forms with the affricate are used by QA speakers. If these forms were true cases of affrication, they would be expected to surface variably with both segments.

Further, some of the items listed in (47) have broken plural forms, which are given in (48). The broken plural forms of those items in (47a-i) that have such forms are treated differently from the broken plural forms of unambiguous cases of affrication in (47j-p), as illustrated in (48).

(48) Doublets

a. ʔakja:s	ʔatʃja:s	‘bags’
b. ktu:f	tʃtu:f	‘shoulders’

<sup>36</sup> It could be argued, however, that this pair is not related to the one in (44g) in the synchronic grammar of QA.

c. *rifgɑ:n	rifdʒɑ:n <sup>37</sup>	‘friends’
d. *firgɑ:n	firdʒɑ:n	‘neighborhoods’
e. ʁimmaɢ	ʁimmadʒ	‘dark (pl.)’
f. ʎittag/ʎta:g	ʎittadʒ/ʎta:dʒ	‘old (pl.)’

## COMPARE:

## Cases of affrication

g. kθɑ:r	*tʃθɑ:r	‘plenty (pl.)’
h. kbɑ:r	*tʃbɑ:r	‘large (pl.)’
i. gra:b	*dʒra:b	‘near (pl.)’
j. rga:g	*rdʒɑ:dʒ	‘transparent, delicate (pl.)’
k. rju:g <sup>38</sup>	*rju:dʒ	‘breakfast’
l. dga:g	*ddʒɑ:dʒ	‘thin, tiny (pl.)’
m. glɑ:l/glʰɑ:lʰ	*dʒla:l	‘small quantity (pl.)’

The forms in (48f) and (48d) surface invariably with the affricate, although the context does not trigger affrication. The forms in (48a-b) and (48e-f) show the same alternation as their singular forms. The broken plural forms of unambiguous cases of affrication, on the other hand, surface invariably with [k]/[g], as demonstrated in (48g-m).

Another pair that patterns with doublets with respect to the variants adopted in the broken plural forms is given in (49).

(49)	Singular	BP	
	a. ʎirdʒ	ʎru:dʒ	‘vein’
	b. ʎirg	ʎru:g	‘vein’

<sup>37</sup> The feminine plural of this item also surfaces invariably with [dʒ]: [rifdʒ-ɑ:t] ~ [rifi:dʒ-ɑ:t]. (48d), on the other hand, has no feminine plural form.

<sup>38</sup> This form means ‘breakfast’ which is etymologically, but maybe not synchronically, related to the singular [ri:g/ri:dʒ] (Johnstone, 1978, p. 293).

This pair exemplifies cases discussed in the literature where affrication still applies although the triggering vowel is separated from [g] by an intervening segment (Cantineau 1936; Mařar, 1969, 1985; Johnstone, 1978). However, I argue such forms have acquired a lexical status with /dʒ/ in the grammar of QA. Johnstone (1978, p. 293) notices this and concludes that the affricate in such forms has come to be “regarded” as a distinct phoneme, in the relevant varieties.

Another difference between unambiguous cases of affrication and what I consider to be doublets is the comparative adjective. This form may surface with either a velar stop or an affricate in items that I consider to be doublets, as in (50a-c), but will surface invariably with the velar stop in adjectives that undergo affrication in the base form, as shown in (50d-i), which correspond to the adjectives given in (4).

(50) Doublets

a. ʔakðab	ʔatʃðab	‘more lying’
b. ʔaɤmag	ʔaɤmadʒ	‘darker’
c. ʔaɤtag	ʔaɤtadʒ	‘older’

COMPARE:

Unambiguous cases of affrication

d. ʔakbar	*ʔatʃbar	‘bigger’
e. ʔakθar	*ʔatʃθar	‘more’
f. ʔagr <sup>ɿ</sup> ab	*ʔadʒr <sup>ɿ</sup> ab/*ʔadʒrab	‘closer’
g. ʔadagg	*ʔadadʒdʒ	‘thinner, smaller’
h. ʔagal <sup>ɿ</sup> ɿ	*ʔadʒal <sup>ɿ</sup> ɿ/*ʔadʒall	‘lesser’
i. ʔaragg	*ʔaradʒdʒ	‘softer, more transparent’

The patterns discussed above can be summarized as follows:<sup>39</sup>

- I. In doublets, all the conjugations of the verbs, including participles and verbal nouns, exhibit the [tʃ] ~ [k] or [dʒ] ~ [g] alternation. Also, nouns/adjectives/adverbs related to these verbs exhibit the same alternation or surface invariably with [dʒ] (e.g. (46f), (47f-g)), but never invariably with [k] or [g]. Verbs and verbal nouns never undergo affrication. Affrication may apply to nouns and adjectives, but only to those that respect the phonetic conditioning of the process.
- II. In doublets, the broken plural forms of nouns/adjectives that exhibit the alternation also exhibit alternation. Affrication does not apply to broken plural forms unless its phonetic conditioning is met in both the base (singular) and the derived form (broken plural).
- III. In doublets, comparative adjectives exhibit the alternation exhibited in the basic form ([tʃ] ~ [k] or [dʒ] ~ [g]), whereas similar forms that are related to unambiguous cases of affrication surface invariably with the velar stop.

### 3.8.2. A counterexample to doublets vs. affrication

There exists one pair that seems to be treated like doublets with respect to its broken plural form (51b), but like a case of affrication with respect to other derivational forms (verb,

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<sup>39</sup> There exists one pair that seems to display affrication adjacent to a front vowel other than [i(:)], for which a doublet classification cannot be supported in the same way as the items in this section. It should be noted, however, that there is no evidence to the contrary either. That is, there is no evidence that it is a case of affrication.

(i) ke:f                      tʃe:f                      ‘how, in what way’

This pair cannot be shown to pattern with doublets, since the criteria that are used for the identification of doublets cannot be used here due to the fact that this pair belongs to functional words. Interestingly, however, neither of these forms is the common word used to convey the function of ‘how, in what way’ in QA, in which the norm is to say [ʃlo:n] ‘how’. Therefore, it could be possible that [tʃe:f] was borrowed from other varieties, such as the variety of the UAE, in which this form is the norm, and then later on, it was “corrected” to [ke:f] which is closer to SA [kajf]. Indeed, Johnstone (1967) and Maṭar (1985) note that because of the increased influence of SA and contact with other varieties of Arabic, there is a tendency to avoid affrication among the younger generations, in items that are shared between the local varieties and SA. Further, there is another lexical item that has the form [ke:f] ‘mood, liking’. This word never undergoes affrication. If it was the case that [ke:f] ‘how’ undergoes affrication in QA, [ke:f] ‘mood, liking’ would be expected to display the same pattern.



participles, verbal noun and comparative adjective) (51c-f). In the synchronic QA grammar, the form in (51a) is a case of affrication with an exceptional broken plural form.

(51)	a. θigi:l/θəgi:l <sup>ʕ</sup>	θidʒi:l	‘heavy’
	b. θga:l/θga:l <sup>ʕ</sup>	θdʒa:l	‘heavy (pl.)’
	but:		
	c. θaggal <sup>ʕ</sup>	*θadʒdʒal	‘to cause to be heavy’
	d. mθaggil <sup>ʕ</sup>	*mθadʒdʒil	‘to cause to be heavy (active participle)’
	e. θəgəl <sup>ʕ</sup>	*θidʒil	‘heavy’
	f. ʔaθgəl <sup>ʕ</sup>	*ʔaθdʒal	‘heavier’

The broken plural of this adjective exhibits the [dʒ] ~ [g] alternation adjacent to a back vowel, while the verb, participles, verbal noun, and comparative adjective surface invariably with [g]. This paradigm seems to have been on its way to becoming a doublet; however, the process stopped before it reached completion. It is more probable that this situation will remain the same or even that there will be a reverse movement in the opposite direction. The affricate will stop surfacing in the broken plural form in order to conform to the regular patterns observed in cases of affrication. Due to the pressure of SA (through education and media), there is an observed tendency among the speakers of QA to abandon the local features of the variety. This tendency is observed in Kuwaiti Arabic (Johnstone, 1967) and Bahraini Arabic (Maṭar, 1985) as well. In addition, there is further pressure on QA in the same direction from the local Bedouin varieties, which are associated with high prestige (Al-Sulaiti, 1993, p. 5), and in which affrication usually does not apply. Al-amadidhi (1985, p.36) reports that the Bedouin population in Qatar are increasingly settling in urban areas and consequently are in more contact with the rest of the community. This development is expected to have an effect on the linguistic output of the community in general.

### 3.8.3 Summary

Since the general pattern of items that may undergo affrication is different from that of the items discussed in this section, I argue for characterizing them differently and consider the latter to be doublets. Even if some of these doublets were the outcome of affrication at an earlier stage of the variety, they are not treated as such in the synchronic grammar of QA.

### 3.9 Residual cases

As in other phonological processes, exceptions to affrication exist. The items given in (52) host the context of affrication, but do not undergo the process. Notice that all of these items are high frequency words that are often associated with unusual patterns.

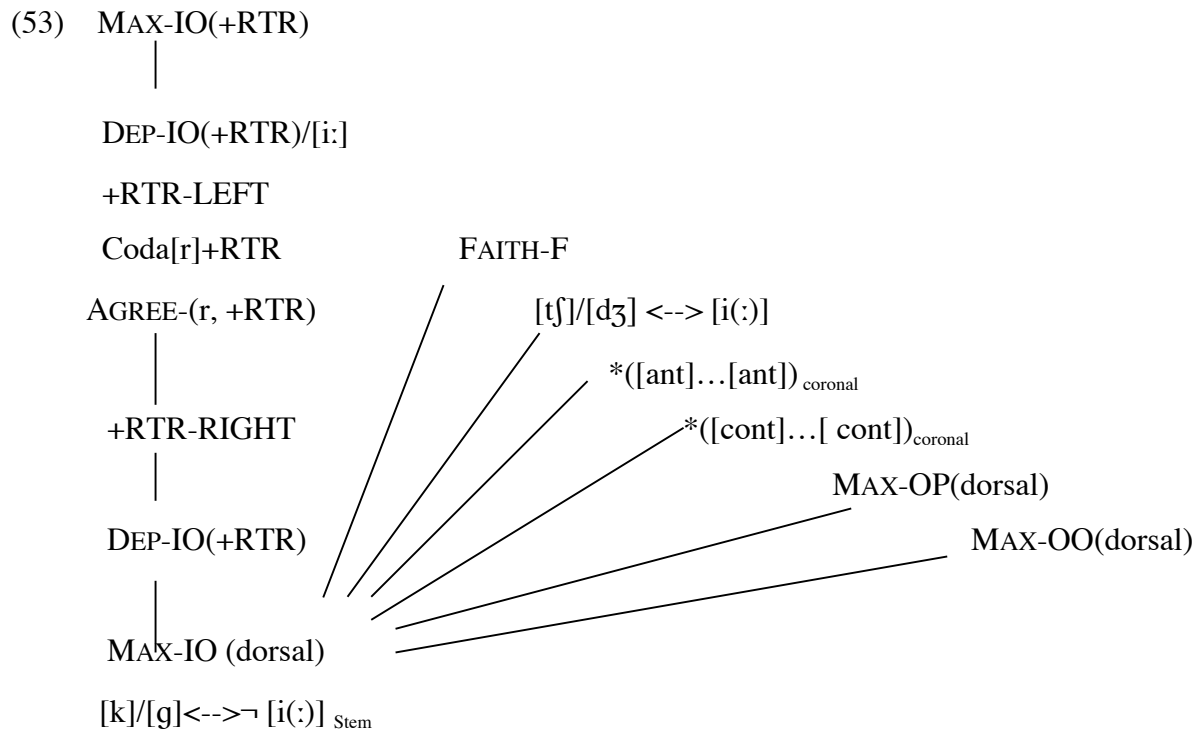
- |      |               |                  |
|------|---------------|------------------|
| (52) | a. kiɦil/kiɦl | ‘kohl, eyeliner’ |
|      | b. kiɦli:     | ‘navy blue’      |
|      | c. giɦɦi:     | ‘stingy’         |
|      | d. kill       | ‘every, all’     |
|      | e. kilm3      | ‘word’           |
|      | f. gibi:l3    | ‘tribe’          |

I cannot find an explanation for affrication blockage in (50d-f). In (50a-c) however, the vowel triggering affrication is followed by the pharyngeal segment [ħ]. This could explain the absence of affrication in these items. Bukshaisha (1985, p. 316) reports that the pharyngeals [ħ] and [ʕ] have a lowering effect on F2 of the adjacent high front vowels, which entails that these vowels surface retracted/lowered in these contexts. It is important to note that the criterion upon which she determines whether a vowel is retracted/lowered or not is F2 at the onset of a vowel preceded by a pharyngeal segment, and F2 at the offset of a vowel followed by one (p. 316-321). This was demonstrated to be not a valid criterion, as discussed in §3.6.1. Hussain (1985, p. 317), on the other hand, argues that these pharyngeal segments have no significant lowering/retracting effect on any vowel, although, his test items did not include [i] in these contexts.

Considering the short duration of [i] in the items (52a-c), it is possible that the retraction/lowering observed at the end of the vowel (in contact with [h]) extends through a significant portion of the vowel. If this is correct, it could be suggested that [i] surfaces retracted/lowered in this context. Hence, affrication is blocked in (52a-c) because its phonetic conditioning is not met.

### 3.10 Conclusion

The final constraint ranking relevant to affrication in QA is given in (53).



In this chapter I proposed an analysis of the affrication of [k] and [g] in QA, within the framework of Optimality Theory. Contrary to previous analyses of affrication in Arabic varieties, the process is found to be triggered only by adjacency to [i(:)], not any other front vowel. Further, other segments that occur adjacent to [k] or [g], including front vowels other than [i(:)], block affrication. The domain of affrication is found to be restricted to the stem. The variable nature of the process is accounted for by having the markedness constraint

[k]/[g]<-->  $\neg$  [i(:)]<sub>stem</sub> and the faithfulness constraint MAX-IO(dorsal) crucially unranked with respect to each other. It is shown that the process does not apply to certain lexical classes due to paradigmatic effects. Verbal paradigms must be subject to an OO-faithfulness constraint that is different from that operative in nominal/adjectival paradigms. This is due to the fact that verbal paradigms lack bases, unlike nominal/adjectival paradigms. Therefore, two types of OO-faithfulness constraints are needed. The first one blocks affrication in certain nominal/adjectival forms (e.g. broken plurals). The second is a dominant Optimal Paradigm-faithfulness constraint and it blocks the process in verbs, active participles, and verbal nouns. Participles and verbal nouns are considered to part of verbal inflectional paradigms since they behave like verbs in QA, as well as in CA. The restrictions that emphasis spread imposes on affrication indicate that the process is a surface phenomenon, as predicted by Optimality Theory. Avoidance of OCP violations is argued to be responsible for affrication blockage in a number of lexical items, which further suggests that the OCP is synchronically active in the grammar of QA. Apparent counterexamples to my analysis are explained as cases of doublets, not affrication.

This variable process exemplifies an extraordinary case where a phonological process is affected by different grammatical levels. The process is influenced by the phonetic representation of the relevant segments on the one hand, and by the morphological relations between words on the other. Between these two ends, the process also interacts with other phonological factors that are operative in the variety.

## 4. LENITION IN ARABIC

### 4.0 Introduction

An important feature of the phonological systems of Eastern Arabic varieties is the lenition of the affricate /dʒ/ to the glide [j] (Johnstone, 1965, 1967; Maṭar, 1969, 1985; Al-amadidhi, 1985; Al-Sulaiti, 1993). The two segments [dʒ] and [j] are suggested to be in free variation, as illustrated in (1). However, not all instances of /dʒ/ may surface as [j] (Johnstone, 1965; Al-amadidhi, 1985), as shown in (2).

- |     |             |          |                           |
|-----|-------------|----------|---------------------------|
| (1) | a. dʒarrab  | jarrab   | ‘he tried’                |
|     | b. nadʒis   | najis    | ‘impure’                  |
|     | c. ta:dʒ    | ta:j     | ‘crown’                   |
|     |             |          |                           |
| (2) | a. dʒaddu:m | *jaddu:m | ‘axe’                     |
|     | b. hidʒra   | *hijra   | ‘room’                    |
|     | c. ʔara:dʒ  | *ʔara:j  | ‘secondhand goods market’ |

The large number of items that are exempted from undergoing the process include borrowings and learned items (Maṭar, 1985), as well as native lexical items (Johnstone, 1965; Al-amadidhi, 1985). This problem has not been adequately dealt with so far.

In this chapter, the data, as represented in QA, are reconsidered in the light of new advancements in phonological theory. Consequently cases that were previously considered to be exceptions to lenition are straightforwardly accounted for. Relevant recent developments are the restrictions imposed by the OCP (McCarthy, 1986; Yip, 1988; Frisch, Broe & Pierrehumbert, 2004) and the effects of underspecification (Inkelas & Cho, 1993; Inkelas, Orgun & Zoll, 1997) on phonological representations, as well as the role of articulation (Jun, 1995; Boersma, 1998; Kirchner, 2001, 2004) in shaping the grammar. These developments establish the base for a proper account of this alternation, which in turn adds to our understanding of lenition processes in general. The current study adds QA (and

by extension Gulf Arabic) to the list of languages in which lenition of an obstruent to a glide applies (see Kirchner, 2001). In addition, evidence is provided for considering the OCP a synchronically active constraint in Arabic, influencing segmental alternations, as well as restricting static distributions (Frisch & Zawaydeh, 2001).

I find that there are three factors contributing to the existence of apparent exceptions to lenition. The first is a segmental restriction. There are certain contexts in which lenition never applies. The first of these contexts is in a coda position preceded by a segment other than [+low] vowels. The other context in which lenition is blocked is in geminates, a restriction that is suggested to hold universally (Kirchner, 2000). On the other hand, lenition is highly favored in contexts in which a faithful mapping of the input violates the OCP, which is a constraint against the co-occurrence of similar segments (McCarthy, 1986; Yip, 1988; Pierrehumbert, 1993; Frisch et al., 2004).

The second factor responsible for the existence of apparent exceptions to lenition is prespecification. Following Inkelas, Orgun & Zoll, (1997), I suggest that a significant number of exceptions to lenition have come to exist as a result of /dʒ/ being fully specified as [-cont] in the underlying representations of these forms, whereas the lexical items in which lenition may apply include /dʒ/ that is underspecified for this feature, in the underlying representation. This issue is further discussed in §4.2.4.2. Lenition is also subject to paradigmatic effects (Benua, 1997; Hayes, 1998; Steriade, 2000; Burzio, 1994; Kenstowicz, 1996, 1998; Gafos, 2003; Albright, 2004; McCarthy, 2005; among others), since the process is blocked in inflected forms whose base resists the process.

Following Hock (1991, p. 80) and Kirchner (2001, 2004, p. 314), I consider lenition to be driven by an imperative to minimize articulatory effort. This requirement manifests itself as a number of constraints named LAZY (Kirchner, 2001, 2004), which interact with faithfulness constraints (McCarthy & Prince, 1995). However, the option for being articulated lazily is only available to /dʒ/, since it is the segment underspecified for the feature [cont].

Lenition may involve a number of different processes, including degemination, flapping, spirantization, debuccalization, voicing and reduction of consonants to

approximants.<sup>2</sup> Lenition of [dʒ] to [j] exemplifies the last case and is not very common. Surveying 272 languages in which lenition applies, Kirchner finds only two in which this segmental alternation takes place. One is West Tarangan, in which it applies only in medial unstressed positions (Kirchner (2001, p. 7), the other is Karao, for which no context is given for the application of the process (Kirchner, 2001, p. 79). Lenition of /dʒ/ to [j] in QA and in a number of other varieties of Arabic provides one additional illustration of this rare alternation.

According to Kirchner (2001, p. 3, 2004, p. 313) lenition designates a sound change whereby “a sound becomes ‘weaker’” as in diachronic sound changes, “or where a ‘weaker’ sound bears an allophonic relation to a ‘stronger’ sound” as in synchronic alternations (see also Foley, 1977). “The core idea, as applied to consonants, is some reduction in constriction degree or duration”. Lenition involves “a ‘relaxation’ or ‘weakening’ of articulatory effort, something that has been called ‘the lazy-tongue phenomenon’” (Hock, 1991, p. 80-81). It is usually triggered by an adjacent vowel, with open vowels being, generally, more capable of triggering the process than close vowels (Kirchner, 2001, 2004). Kirchner argues that in VC contexts, the distance and effort that the articulators need to travel from an open segment ([+low]) to the constriction of a following consonant is more than the distance and effort that the articulators need to travel from a close segment ([+high]) to the constriction of a following consonant, everything else being equal. Similarly, in CV contexts, the distance and effort that the articulators need to travel to an open segment ([+low]) is more than the distance and effort needed to travel to a close segment ([+high]). Lenition is the outcome of minimizing the effort needed to reach the consonantal constriction by relaxing the muscles responsible for this constriction, which results in a weakening of that constriction (2001, p. 30).

Other approaches to lenition include lenition as deletion, lenition as sonority promotion and lenition as a decrease in duration and magnitude of gestures. Each of these theories captures certain aspects of lenition processes, but not all. For example, a theory that approaches lenition as deletion and simplification of word structure misses the

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<sup>2</sup> For examples of languages in which these processes apply, the reader is referred to Kirchner (2001).

generalization that a lenited segment is usually a segment that is more intense in terms of voicing and sonority than its input (Lavoie, 2000). That is, lenition may involve the acquisition of features, rather than their deletion. Lenition as sonority promotion, on the other hand, cannot account, for example, for cases in which the output of lenition is zero, which can never be viewed as more sonorous than the input of the process (Kirchner, 2001). Lenition as a decrease in duration and magnitude gestures contradicts with the experimentally based findings of Lavoie (2000), who suggests that decrease in duration does not always coincide with decrease in magnitude (for a more extensive discussion of different approaches to lenition, the reader is referred to Lavoie, 2000; Kirchner, 2001; and references therein).

The chapter is organized as follows: §4.1 presents a general discussion of lenition in Arabic. This section starts with the historical and the geographic background of the process (§4.1.1), followed by a discussion of previous analyses of lenition (§4.1.2). An OT analysis of lenition in QA is proposed in §4.2 and compared to the general characteristics of lenition processes discussed in the literature in §4.3. The conclusion is given in §4.4.

## **4.1 Lenition in Arabic**

### *4.1.1 Historical and geographic background*

Historically, the CA/SA voiced palato-alveolar affricate /dʒ/ is a reflex of the proto-Semitic /\*g/ (Martinet, 1959, p. 91; Moscati, 1969, p. 38; Cantineau, 1950, p. xxv, 1952, p. 87; Bergsträsser, 1983, p. 162; Fischer, 1997, p. 189; Watson, 2004, p. 16). In early CA /\*g/ was palatalized partially to /gʲ/ (Cantineau, 1960, p. 58) or totally to /j/ (Watson, 2004, p. 16; and references therein). However, the original Semitic pronunciation was still in use in medieval Arabic, as observed by the Old Grammarians in the varieties of some Arabs (Sībawayh, 1999 version, p.572; Ibn Jinnī, 1993 version, p. 46).

Currently, the CA /dʒ/ has different reflexes in different varieties of Arabic, as summarized in table (4). It is realized as /g/ in the major cities of Egypt and in parts of Yemen, including the city of San‘a (Bergsträsser, 1983, p. 186; Maṭar, 1985, p. 135; Kaye & Rosenhouse, 1997, p. 274; Watson, 2004, p. 16). Cantineau (1936, p. 27, 1937, p. 138) notes



that Classical <dʒ> is realized as [g], [gʲ] and [dʲ] in the varieties of the Shammaṛī and ‘Anayzī tribes of the Syro-Mesopotamian region and in the speech of some Najdis (in Saudi Arabia). /gʲ/ for /dʒ/ is also found in some parts of Yemen (Kaye & Rosenhouse, 1997, p. 274). On the other hand, /dʒ/ is realized as /j/ in Upper Egypt and some parts of Sudan, northern Yemen, and the Arabian Peninsula (Watson, 2004, p. 16), including the varieties of Abu Dhabi and Qatar (Johnstone, 1967), although only for some speakers in the latter (Al-amadidhi, 1985).

The CA /dʒ/ remains intact in the majority of the Bedouin varieties, in rural Levantine varieties and in most of Iraq, as well as in the central region of northern Yemen (Cantineau, 1936; Younes, 1994; Watson, 2004). /dʒ/ is realized as /dʲ/ the variety of Medina (Saudi Arabia) as in some parts of Sudan (Kaye & Rosenhouse, 1997, p. 274). In the varieties of the Bedouins of Egypt and those of the major cities in the Levant, as in Moroccan, Algerian and Tunisian varieties, CA /dʒ/ is lenited to /ʒ/ (Bergsträsser, 1983, p. 162; Maṭar, 1985, p. 135; Watson, 2004, p. 16; Kaye & Rosenhouse, 1997, p. 274-275; Wāfi, 2000; p. 107).<sup>3</sup> CA /d ʒ/ is further lenited to [j] in certain Bedouin varieties in the Levant as in Khuzistān (Iran), Ḥadramawt (Yemen), Ḍufār (Oman), and in the Gulf dialects (Maṭar, 1985, p. 137; Ḥijazī, n.d., p. 25; Hussain, 1985; cf. Watson, 2004).

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<sup>3</sup> Sporadically, /dʒ/ surfaces as [tʃ] in certain words in the speech of the Mana:thra, Hadi:di:n and in Rögga, in the Syro-Mesopotamian region (Cantineau, 1936, p. 26).

Table (4): The reflexes of CA/SA /dʒ/ in modern varieties of Arabic

Proto-Semitic *g	Regions/varieties	Source
g	-Egypt -Yemen (San‘a)	Bergsträsser (1983), Maṭar (1985), Watson (2004) Kaye & Rosenhouse (1997).
g, g <sup>j</sup> , d <sup>j</sup>	-The Syro-Mesopotamian desert (Shammaṛī and ‘Anayzī tribes) -Saudi Arabia (Najd)	Cantineau (1936).
g <sup>j</sup>	-Yemen	Kaye & Rosenhouse (1997).
ʃ	-Upper Egypt -Parts of Sudan -Northern Yemen -Arabian Peninsula	Johnstone (1967), Al-amadidhi (1985), Watson (2004).
dʒ	-Classical/Modern Standard Arabic -The majority of the Bedouin varieties -Rural Levantine varieties -Most Iraqi varieties -The central region of northern Yemen	Cantineau (1936), Younis (1994), Watson (2004).
d <sup>j</sup>	-Saudi Arabia (Medina) -Sudan	Kaye & Rosenhouse (1997).
ʒ	-Egypt (Bedouin) -Major cities in the Levant -Morocco, Algeria and Tunisia	Maṭar (1985), Watson (2004), Bergsträsser (1983), Wāfī (2000).
j	-Gulf dialects -Oman (Ḍufār) -Iran (Khuzistān) -Bedouin varieties in the Levant -Yemen (Ḥadramawt)	Kaye & Rosenhouse (1997), Maṭar (1985), Ḥijazī (n.d), Hussain (1985), Watson (2004).

The alternation between [dʒ] and [j] is an old phenomenon in the Arabic language. The earliest evidence comes from the Liḥyānī inscriptions (2<sup>nd</sup> c. BC -6<sup>th</sup> c. AD),<sup>3</sup> in which

<sup>3</sup> Pre-Islamic Arabic inscriptions found in north west of the Arabian Peninsula (Al-Jundī, 1983, p. 379).

the affricate <dʒ> was used for CA <j>. The medieval Arab scholars report that in some varieties of Arabic, [dʒ] was substituted by [j] (lenition), in others, [j] was substituted by [dʒ] (fortition)<sup>4</sup> ('Anīs, 1995, p. 270).

Unconditional fortition of [j] to [dʒ] was attested in the variety of Fuqaym Dārim, a branch of the tribe of Tamīm (Al- Šālih, 1989, p. 95; 'Anīs, 1995, p. 126) and in the variety of Banī Dubayr from Banī Asad and that of banī Ḥanzāla, in which geminate [j] (the suffix of relative adjectives [-ijj]) also turned to geminate [dʒ], as in [tamīm-idʒdʒ] < [tami:m-ijj] (Sallūm, 1986, p. 95). However, in the variety of some branches of Bani Sa'ad, which is also a branch of Tamīm, geminate [j] turned to [dʒ] only when it occurred at the end of the phrase, that is, before a pause (Sibawayh, IV, 1999, version, p. 296; Al-Muṭṭalibī, 1978, p. 101-103; 'Anīs, 1995, p. 270). The process also applied in the variety of the tribe of Quḍā'a, in which it was conditioned by a preceding [ʔ] (Sallūm, 1986, p. 95; 'Anīs, 1995, p. 126; Al-Jundī, 1983, p. 374-379). Currently, /j/ > [dʒ] is observed in Ḥaḍramawt (Yemen), in some modern Southern Arabian dialects and in Tigré, a Semitic language spoken in North Ethiopia (Al-Jundī, 1983, p. 379). Also, traces of /j/ > [dʒ] are found in the variety of Abu Dhabi (e.g. jo:m > dʒo:m 'when'), which belongs to the Eastern group of North Arabic dialects (Johnstone, 1967, p. 37).

It is worth noting that all of the examples for [j] > [dʒ] that are cited in the old texts consist of cases in which [j] appears in a coda position, either alone or as the first element of a geminate (in pre-pausal contexts, the second member of the geminate is also in a coda position). Further, they all involve contexts in which [j] is preceded by the high front vowel [i]. When [j] is in a coda position preceded by [i], it is perceptually difficult to detect due to the lack of contrast between the two segments. Therefore, the fortition of [j] to [dʒ] seems to be motivated by the need for perceptual saliency (for the role of perception in phonology,

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<sup>4</sup> Passy (1890, p. 344) reports the following change from Latin to a number of Italian dialects: teneo > tenio > tenjo > tenjo (cited in Bauer, 1988, p. 390). The last change is similar to [j] > [dʒ] in Arabic, except that [dʒ] is an affricate and [j] a stop. Also, the palatal liquid [λ] of Spanish turns to [j] then to [dʒ], in a dialectal Spanish (Hock, 1991, p. 79).

see for example Flemming, 1995; Jun, 1995; Boersma, 1998; Hume, 1999; Kochetov, 1999; Steriade, 1999a, b, 2001; Côté, 2000, 2004; Kang, 2000; Hume & Johnson, 2001).

On the other hand, [dʒ] turned to [j] in the varieties of the majority of Tamīm (Sallūm, 1986; Maṭar, 1985, p. 142; Al- Ṣāliḥ, 1989, p. 96; p. 111; 'Anīs 1995, p. 270), as the following examples<sup>5</sup> illustrate:

(3)	CA		Dialectal	
	a. < s <sup>ʕ</sup> ihri:dʒ>	>	<s <sup>ʕ</sup> ihrij> <sup>6</sup>	'tank'
	b. <dʒa:r>	>	<ja:r>	'neighbour'
	c. <ʃudʒajra>	>	<ʃijajra>	'tree (diminutive)'
	d. <ʃadʒara>	>	<ʃijara>	'tree'

Currently, the lenition of [dʒ] to [j] is observed in different parts of the Arabian Peninsula and in some of the surrounding regions. It is a characteristic of the varieties of Kuwait, Bahrain, Qatar, the UAE, and Al- Ḥasa (east coast of Saudi Arabia), which all belong to the Eastern Arabic group (Johnstone, 1967). The substitution also occurs in some parts of Najd and Al-Jawf in Saudi Arabia. It is also reported for the varieties of the tribes of Sirḥān and Sardiya in the Levant (Cantineau, 1936, p. 24, 1937, p. 137; Johnstone, 1965, 1967; Maṭar, 1969, 1985, p. 137; Al-Muṭṭalibī, 1978, p. 100; Kaye & Rosenhouse, 1997, p. 275; Ḥijāzī, n.d, p. 25)). The same alternation is observed in the speech of the tribes of lower Euphrates, Ahwaz (a predominantly Arabic speaking city south west of Iran), and in Al-Basra, in southern Iraq (Wetzstein, 1868, p. 163; Socin, 1901, p. 237; cited in Johnstone, 1965, p. 234). It is also attested in the Arabic variety of Charak (Southern Iran), and in some South Arabian dialects (Johnstone, 1967, p. 11; Maṭar, 1985, p. 136). For example,

<sup>5</sup> Since these examples are given in Arabic orthography, only the sources that cite them in the vowelized version of this orthography are given. Items (a), (b) and (c) are cited from Al-Ṣāliḥ (1989, p. 96), (d) appears in 'Anīs (1995, p. 270) and Al- Ṣāliḥ (1989).

<sup>6</sup> Since the structure [i:ʃ] is prohibited in Arabic, [i:] is shortened and the extra slot is filled by geminating the glide [j].

Landberg reports the occurrence of this substitution in Ḥadramawt (Yemen) and Rhodokanakis (1911) notes it for the variety of Ḍufār in Oman (cited in Johnstone, 1965, p. 234-236; Al-amadidhi, 1985, p. 25<sup>7</sup>).

#### *4.1.2 Previous analyses and findings related to the lenition of [dʒ] to [j]*

The first modern scholar to report the occurrence of this phenomenon in Arabic is Wetzstein (1868), who indicates that the substitution occurs word initially in the varieties of certain tribes in the Syro-Mesopotamian desert, southern Iraq and north of Saudi Arabia. Socin (1901, III, p. 194) confirms this restriction for different varieties in the northern region of Saudi Arabia (as cited in Cantineau, 1936, p. 24). However, all the other scholars who investigated this alternation suggest that the process may occur in all positions in the word and that it is phonetically unconditioned (Cantineau, 1936; Johnstone, 1965, 1967; Maṭar, 1969, 1985; Al-amadidhi, 1985). Nevertheless, it is admitted that the process does not apply to all the lexical items that include /dʒ/ (Cantineau, 1936, p. 25, 1937, p. 137; Johnstone, 1965, Al-amadidhi, 1985, p. 26; Maṭar, 1969, 1985; Ḥijāzī, n.d., p. 25). That is, certain lexical items systematically undergo the process, while others never do (Cantineau, 1936, 1937), indicating that the process is lexically conditioned.

Most previous studies attribute this lexical distinction to each word's degree of integration into everyday language and into the system of the local varieties in general. That is, the more an item is integrated and is common in everyday language, the higher the likelihood of lenition. The more an item is learned or its borrowing characteristic is apparent, if it is a borrowing, the less the likelihood of undergoing the process (Ḥijāzī, n.d., p. 25; Maṭar, 1969, p. 19, 1985, p. 138). However, Johnstone (1965, p. 237) finds that in the variety of Ahwaz, many common words such as [wa:dʒib] 'duty', [dʒabha] 'forehead' and [dʒira:da] 'locus' do not undergo lenition. Similarly, in the Kuwaiti variety, old established nautical borrowings (e.g. [dʒi:b], [dʒilinga], [dʒalbu:t]) never undergo lenition (Johnstone,

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<sup>7</sup> The referential information for Landberg and Rhodokanakis (1911) is not given in these sources.

1965, p. 238).<sup>8</sup> In addition to the lexical restriction on this process, Hussain (1985, p. 14) argues for the existence of a semantic restriction according to which the process gets blocked if the output is a homophone to an existing word in the variety. This argument, however, is not convincing since homophones are abundant in Gulf Arabic (GA), whether due to faithful mappings of underlying forms or as a result of undergoing phonological processes. Further, items related to religious rituals or concepts are suggested to resist lenition (Al-amadidhi, 1985, p. 158), even if they are part of the everyday repertoire.

Lenition does not apply equally in all the relevant varieties. For example, Cantineau (1937, p. 137) suggests that the sound substitution has no exceptions in the variety of the people of Al-Jawf, two exceptions in the variety of Sirḥān (1936, p. 25), and a few more in the variety of Sardiya (1937, p. 137). Also, in the UAE, the process is more common and affects more lexical items than in the other Eastern Arabic dialects (Johnstone, 1965, p. 240). Within Qatar, the process is more robust in the variety of the people living in the north than that of those living in Doha or in the south of the country (Johnstone, 1965, p. 239-240).

In addition, varieties differ as to whether the process applies optionally or obligatorily. The substitution is reported to occur freely, [dʒ] and [j] being in free variation, in the varieties of Kuwait, the UAE, and Qatar (Johnstone, 1967; Al-amadidhi, 1985), as in one of two Bahraini varieties investigated by Maṭar (1985)<sup>9</sup> and in the variety of Abu Dhabi (Kaye & Rosenhouse, 1997, p. 275). The segments [dʒ] and [j] are also in free variation in the Arabic variety of Ahwāz (Johnstone, 1965, p. 237) and in the varieties of southern Iraq and Najd (Al-Muṭṭalibī 1978, p. 100). However, the situation seems to be less clear for the other varieties. For example, although Cantineau (1936, p. 24-25) indicates that <dʒ> always surfaces as [j] in the variety of the tribe of Sirhan (north-west of the peninsula), he mentions that his informants from this tribe consistently used [dʒ] in their speech and that later on, the chief of that tribe repeated the same words “corrected” to [j], except in the words [dʒawz,

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<sup>8</sup> Johnstone notes that the fact that they are borrowings should not exclude these items from undergoing lenition since other borrowed items may undergo other phonological process observed in the variety (for examples, see Johnstone, 1965, p. 238).

<sup>9</sup> The alternation is not observed in the other variety of Bahrain.

dʒawza] ‘Adam’s apple’. Cantineau’s (1937) informant from the tribe of Sardiya and that of Al-Jawf did the same thing, that is, using [dʒ] in all of the relevant words at the beginning of the conversation, then, later on “correcting” them to [j].<sup>10</sup> The status, accordingly, of the [dʒ] and [j] usages is unclear and it cannot be established to what extent [dʒ] > [j] is an obligatory or an optional process in these varieties.

It is also suggested that sociolinguistic factors such as age, level of education and degree of formality may affect the process (Johnstone, 1965, p. 240; Al-amadidhi, 1985, p. 243, p. 285; Maṭar, 1985, p. 140). The higher the level of education of the speaker, which coincides with belonging to younger generations, and the more formal the conversation, the higher the probability that /dʒ/ surfaces as [dʒ]. However, even with the influence of these factors, highly frequent items are least likely to surface with [dʒ] (Johnstone, 1956; Al-amadidhi, 1985, p. 289). These tendencies, obviously, can only be relevant for the varieties in which the process applies optionally. Ethnicity is another sociolinguistic factor influencing the process. For example, Al-amadidhi (1985, p. 186) reports that /dʒ/ surfaces as [j] more often in the speech of the non-Bedouin social groups in Qatar.

To sum up, most previous studies suggest that the alternation between [dʒ] and [j] is phonetically unconditioned (see, however, Wetzstein, 1868; Socin, 1901). The alternation is reported to be optional in some varieties, including QA. However, the process is suggested to be lexically determined, and the lexical items that resist the alternation and always surface with [dʒ] may vary inter-dialectally.

## 4.2 An OT analysis of lenition in Qatari Arabic

### 4.2.1 *The distribution of [dʒ] and [j]*

As in other varieties of Arabic that exhibit this alternation, lenition is only possible in a subset of the items that include /dʒ/. When lenition is permitted, it is always optional. Both variants, [dʒ] and [j], may occur word initially, medially and finally, as illustrated in (4). Unlike affrication (chapter 3), lenition may apply equally to all syntactic categories.

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<sup>10</sup> In the dialect of Sardiya more exceptions were observed and in the dialect of the people of Al-Jawf no exception was reported.

- (4)
- |    |         |        |                         |
|----|---------|--------|-------------------------|
| a. | dʒa     | ja     | ‘he came’               |
| b. | ħdʒɑ:ma | ħja:ma | ‘cupping’               |
| c. | χandʒar | χanjar | ‘dagger’                |
| d. | dʒiri:ʃ | jiri:ʃ | ‘coarsely ground wheat’ |
| e. | dʒdiri: | jdiri: | ‘smallpox’              |
| f. | dʒinni: | jinni: | ‘genie’                 |
| g. | ta:dʒ   | ta:j   | ‘crown’                 |
| h. | nadʒma  | najma  | ‘a star’                |

Contrary to the predictions made in the literature with respect to lenition processes in general, lenition in QA applies more frequently (in more lexical items) in the onset as compared to the coda position, and intervocalic position does not have a special effect in promoting the process (§4.3) (cf. Kirchner, 2001, 2004; Lavoie, 2000; and references therein).

Further, there are items in which a historic [dʒ] categorically surfaces as [j] in synchronic QA. Among these are the items given in (5).<sup>11</sup>

- (5)
- | SA          | QA      |                |
|-------------|---------|----------------|
| a. ʔadʒu:z  | ʔaju:z  | ‘old woman’    |
| b. madʒnu:n | majnu:n | ‘crazy’        |
| c. dʒunn(a) | jann    | ‘he got crazy’ |
| d. wadʒh    | wajh    | ‘face’         |
| e. dʒɑ:hil  | ja:hil  | ‘kid’          |
| f. ħudʒu:l  | ħju:l   | ‘anklets’      |
| g. ʔaʔwadʒ  | ʔawaj   | ‘bent’         |

<sup>11</sup> (5a) may also mean ‘old man’ in SA, and (5e) means only ‘ignorant’ in SA.



Since no alternation is observed in such items, I consider them to be lexically represented with /j/ in the synchronic grammar of QA.

#### 4.2.2 *Basic constraints*

Following Kirchner (2001, 2004), I consider lenition to be motivated by an effort-minimizing constraint named LAZY, as given in (6).

(6) LAZY

Segments are articulated lazily.

This constraint is applicable only to the voiced affricate /dʒ/, which is the only segment for which the option of being articulated lazily is available, by virtue of being underlyingly underspecified for the feature [cont]. The output enforced by this constraint could be virtually any segment that has a less effortful stricture than [dʒ]. However, since glides are the least effortful segments among consonants (Kirchner, 2001, p. 91), [j] is optimal.<sup>12</sup> LAZY interacts with the faithfulness constraint, given in (7), which militates against the deletion of the feature [+strident].

(7) Faithfulness: MAX-IO (+strident)

Every [+strident] specification in the input is present in the output.

MAX-IO (+strident) is employed instead of IDENT-IO (+strident) because MAX/DEP constraints are found to better accommodate the different factors influencing both processes: affrication and lenition in QA. For justification of the existence of MAX-F constraints, the reader is referred to LaMontagne & Rice (1995) Pulleyblank (1996), Causley (1997), Walker (1999), Lombardi (1998, 2001), and Zhang (2000).

To account for the variability of the process, constraints (6) and (7) need to be

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<sup>12</sup> Kirchner's effort hierarchy is as follows: strident affricates > strident fricatives > stops > nonstrident fricatives > glides (2001, p. 91-92). Other glides, namely, [w, ʔ, h] are not optimal since they are unfaithful to the input at least in their feature specification for [place]. On the other hand, [ʒ] is ruled out by structure preservation since it does not belong to the phonemic inventory of QA. This effect could be obtained by a dominating markedness constraint \*ʒ.

crucially unranked with respect to each other (Anttila, 1997; Anttila & Cho, 1998; Côté, 2000, 2004; Auger, 2001; among others). Lenition may apply only when LAZY outranks MAX-IO (+strident) (tableau 2). When the ranking is the opposite, lenition is blocked, as in tableau (1). To rule out other unfaithful mappings, constraints (8) and (9) are necessary.<sup>13</sup> Constraints (8) and (9) do not need to outrank the basic constraints governing lenition, since the same outcome could be obtained whether they are ranked higher or lower, as illustrated in tableau (1).

(8) Faithfulness: MAX-IO(voice)


Every [voice] specification in the input is present in the output.

(9) Faithfulness: MAX-IO(anterior)

Every [anterior] specification in the input is present in the output.

Tableau (1)

Constraint ranking: MAX-IO (+strident) » LAZY, MAX-IO(voice) » MAX-IO(anterior)

/dʒ/	MAX-IO(+strident)	LAZY	MAX-IO(voice)	MAX-IO(anterior)
a.  dʒ		*		
b. j	*!			
c. tʃ		*	*!	
d. ʃ		*	*!	
e. g	*!	*		*
f. ʁ	*!	*		*
g. z		*		*!

In tableau (1), candidates (b) and (e-f) are ruled out by violating the highly ranked faithfulness constraint MAX-IO(+strident). Candidates (a), (c) and (g) violate LAZY. However, by violating the faithfulness constraints MAX-IO(voice) and MAX-IO(anterior), candidates (c) and (g) are ruled out and the faithful candidate (a) is optimal.

<sup>13</sup> In Kirchner's (2001) proposal, affricates incur four violations to LAZY, strident fricatives three, stops two and glides only one. In the current study, however, for the sake of simplicity, the glide is suggested to incur no violations to this constraint, and all the other outputs incur an equal number of violations to LAZY. This, however, has no bearing on the analysis.

Tableau (2)

Constraint ranking: MAX-IO(voice), MAX-IO (+strident) » LAZY » MAX-IO(anterior)

/dʒ/	LAZY	MAX-IO(+strident)	MAX-IO(voice)	MAX-IO(anterior)
a. dʒ	*!			
b. ɬj		*		
c. tʃ	*!		*	
d. ʃ	*!		*	
e. g	*!	*		*
f. ʁ	*!	*		*
g. z	*!			*

In tableau (2), all the candidates except candidate (b) violate the highly ranked constraint (LAZY); therefore, candidate (b) is optimal.

### 4.2.3 Segmental restrictions

#### 4.2.3.1 Syllabic position

Lenition applies more robustly in the onset as compared to the coda position (see the items listed in (2) and (4), above and (10) below).

- (10)
- |            |         |                             |
|------------|---------|-----------------------------|
| a. mo:dʒ   | *mo:j   | ‘wave’                      |
| b. ɦidʒra  | *ɦijra  | ‘room’                      |
| c. zo:dʒ   | *zo:j   | ‘husband’                   |
| d. ɦa:ridʒ | *ɦa:rij | ‘heart burn’                |
| e. zi:dʒ   | *zi:j   | ‘edging, cord (in clothes)’ |
| f. θaldʒ   | *θalj   | ‘ice, snow’                 |
| g. ɦaldʒ   | *ɦalj   | ‘mouth’                     |
| h. ʁaldʒ   | *ʁalj   | ‘incomprehensible’          |
| i. bandʒ   | *banj   | ‘anesthesia’                |
| j. dirdʒ   | *dirj   | ‘drawer’                    |
| k. ta:dʒ   | ta:j    | ‘crown’                     |

l. nadʒma	najma	‘a star’
m. faradʒ	faraj	‘p.n. (m)’
n. dʒo:hara	jo:hara	‘gem’

The data indicate that when in the coda position, lenition applies only if preceded by low vowels (10k-n). When preceded by other segments, lenition is blocked. The items in (10a-j) can be contrasted with those in (4), where lenition applies in similar segmental contexts but with [dʒ] in the onset rather than the coda position.

Having a more restrictive context in the coda is consistent with the general phonotactics of QA. For instance, three-consonant clusters are permitted in the onset, but never in the coda (Bukshaisha, 1985).<sup>14</sup> Also, more varying sequences of segments are tolerated in the onset than in the coda position (Bukshaisha, 1985; Al-Sulaiti, 1993). For example, the Sonority Sequencing Principle (SSP), which militates against sequences of descending sonority in the onset, and sequences of rising sonority in the coda (e.g. Clements, 1990), is frequently violated in the onset, in underlying forms that are faithfully mapped into the output (11a-f), as well as in derived forms. In contrast, the SSP is never violated in the coda (Bukshaisha, 1985; Al-Sulaiti, 1993).<sup>15</sup>

(11)	a. jla:l	‘head cover’
	b. wza:r	‘a masculine piece of clothes’
	c. jda:r	‘wall’
	d. jħala	‘water jar’
	e. rt <sup>ʕ</sup> ab	‘half-ripe dates’
	f. rgiba	‘neck’
	g. dʒdiri:      jdiri:	‘smallpox’
	h. dʒba:l      jba:l	‘mountains’

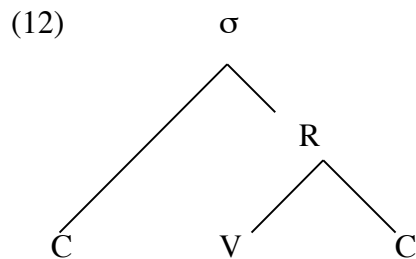
<sup>14</sup> Bukshaisha discusses these clusters in terms of word initial vs. word final, not as onset vs. coda.

<sup>15</sup> This observation is based on Clements’ sonority hierarchy: glides > liquids > nasals > obstruents.

i. dʒma:l	jma:l	‘camels’
j. dʒlu:d	jlu:d	‘skins’

The fact that lenition in the coda is triggered only when adjacent to low vowels is consistent with Kirchner’s (2001, 2004) suggestion that generally lenition is triggered when adjacent to segments that have articulation points with wide strictures. Since the vowels [a, ɑ:] have wider strictures than those of the other segments (consonants and vowels), only these two vowels are capable of triggering the process in this position.

Considering the syllable tree in (12), the situation described above can be accounted for by decomposing the constraint LAZY into three distinct constraints, as given in (13), (14) and (15), ranked according to (16). That is, constraint (13) must be dominated by both constraints (14) and (15), which are crucially unranked with respect to each other and with respect to constraint (7).



(13) LAZY<sub>Rime</sub>

A consonant dominated by a rime node is articulated lazily.

(14) (LAZY/[+low])<sub>Rime</sub>

If a consonant C is adjacent to a low vowel, and both segments are dominated by a rime node, then C is articulated lazily.

(15) LAZY<sub>Syllable</sub>









A consonant dominated directly by a syllable node is articulated lazily.

(16)  $(\text{LAZY}/[+\text{low}])_{\text{Rime}}, \text{LAZY}_{\text{Syllable}}, \text{MAX-IO}(+\text{strident}) \gg \text{LAZY}_{\text{Rime}}$

Constraint (13) is violated whenever the affricate [dʒ] surfaces in a coda position. Whereas constraint (14) is violated only when [dʒ] surfaces in a coda position, preceded by low vowels. (15) is violated by [dʒ] surfacing in an onset position.

Tableau (3)<sup>16</sup>

Constraint ranking:  $(\text{LAZY}/[+\text{low}])_{\text{Rime}}, \text{LAZY}_{\text{Syllable}}, \text{MAX-IO}(+\text{strident}) \gg \text{LAZY}_{\text{Rime}}$

i. /Xdʒ\$/	$(\text{LAZY}/[+\text{low}])_{\text{Rime}}$	$\text{LAZY}_{\text{Syllable}}$	$\text{MAX-IO}(+\text{strident})$	$\text{LAZY}_{\text{Rime}}$
a.  Xdʒ\$				*
b.  Xj\$			*!	
ii. /\$dʒX/				
a.  \$dʒX		*		
b.  \$jX			*	
iii. /Adʒ\$/				
a.  Adʒ\$	*			*
b.  Aj\$			*	
iv. /\$dʒA/				
a.  \$dʒA		*		
b.  \$jA			*	

In (i) of tableau (3), the lenited candidate (b) is ruled out by violating the faithfulness constraint  $\text{MAX-IO}(+\text{strident})$ , whereas in (ii) both candidates are optimal as a result of having  $\text{MAX-IO}(+\text{strident})$  and  $\text{LAZY}_{\text{Syllable}}$  crucially unranked with respect to each other. Notice that in (iii) and (iv), in which [dʒ] is adjacent to a low vowel, variable lenition applies, regardless of the syllabic position of [dʒ].

<sup>16</sup> X represents any segment other than low vowels, and A represents a low vowel. It should be noted that I am not considering pharyngeal and laryngeal segments, which are [+low], to be relevant, since the main issue here is the degree of openness of the stricture. A better feature to characterize low vowels in this respect could be [+open].

#### 4.2.3.2 Geminates

Geminates are reported to be sometimes resistant to process that may affect their featural identity (Schein & Steriade, 1986; McCarthy, 1986; Hayes, 1986a, 1986b; Keer, 1999; among others). However, unlike the case with other phonological processes, lenition is always blocked in geminates (Inkelas & Cho, 1993; Kirchner, 2000; Lavoie, 2000; Keer, 1999), which is exemplified in (17).

- |      |                           |                     |  |
|------|---------------------------|---------------------|--|
| (17) | a. ɦidʒdʒa                | ‘excuse’            |  |
|      | b. tidʒdʒa:r              | ‘merchants’         | (compare: [ta:dʒir/ta:jir] ‘merchant’) |
|      | c. didʒi:dʒ <sup>17</sup> | ‘fishing net’       |  |
|      | d. nadʒdʒa                | ‘he rescued, saved’ |  |
|      | e. ɦadʒdʒi:               | ‘Pilgrim’           |  |
|      | f. sadʒdʒal               | ‘he registered’     |  |
|      | g. nadʒdʒa:r              | ‘carpenter’         |  |
|      | h. ɖ <sup>ʰ</sup> adʒdʒa  | ‘noise’             |  |
|      | i. s <sup>ʰ</sup> ədʒdʒ   | ‘true, truth’       |  |

With the exception of (17i), one of the elements in each geminate in the items above occurs in an onset position (the second member of the geminate in these items is in an onset position, except for (17c), in which only the first member is in that position), a position on which there is no restriction on lenition. Nevertheless, the process does not apply to these items.

In (17i), lenition is independently blocked, since both elements of the geminate in this form occur in a coda position preceded by a segment other than low vowels, as demonstrated in tableau (4). The vowel in (17i) surfaces lowered/retracted due to emphasis spread.

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<sup>17</sup> Although the geminate in this form is a long-distance geminate, following McCarthy (1986), I consider the two elements to be doubly linked to a single root node, therefore, subject to the restrictions on adjacent geminates.

Tableau (4)

Constraint ranking: (LAZY/[+low])<sub>Rime</sub>, MAX-IO(+strident), LAZY<sub>Syllable</sub> » LAZY<sub>Rime</sub>

/s <sup>f</sup> idʒdʒ/	(LAZY/[+low]) <sub>Rime</sub>	MAX-IO(+strident)	LAZY <sub>Syllable</sub>	LAZY <sub>Rime</sub>
a. <del>s</del> s <sup>f</sup> əɖʒdʒ				**
b. s <sup>f</sup> əjj		*!*		
c. s <sup>f</sup> əjdʒ		*!		*
d. s <sup>f</sup> əɖʒj		*!		*

However, these constraints cannot block lenition in the forms given in (17a-h), as illustrated in tableau (5).

Tableau (5)

Constraint ranking: (LAZY/[+low])<sub>Rime</sub>, MAX-IO(+strident), LAZY<sub>Syllable</sub> » LAZY<sub>Rime</sub>

/ħadʒdʒi:/	(LAZY/[+low]) <sub>Rime</sub>	MAX-IO(+strident)	LAZY <sub>Syllable</sub>	LAZY <sub>Rime</sub>
a. <del>ħ</del> ħadʒdʒi:	*		*	*
b. <del>ħ</del> ħajji:		**		
c. <del>ħ</del> ħajdʒi:		*	*	
d. <del>ħ</del> ħadʒji:	*	*		*

Since stops lenite to fricative and voiceless obstruents to voiced obstruents, Kirchner (2000) suggests that lenition is blocked in geminates because the effort required to maintain the oral constriction for geminate stops and voiceless geminates is less than that required for geminate fricatives and voiced geminates, respectively. Since lenition is motivated by an effort-minimizing requirement, the process is blocked in geminates. Although this argument may be valid for spirantization and voicing blockage in geminates, it does not account for the reduction of obstruents to sonorants, as is the case of lenition in QA.

On the other hand, based on a typological survey and an experimental study on geminates in Arabic, Kawahara (to appear) finds that geminate sonorants are more marked than geminate obstruents. He reports that geminate glides are the most marked type of geminates. The markedness of geminate glides is perceptually based, since they are easily confused with their singleton counterparts. Kawahara proposes the following universal constraint ranking: \*GG (glide) » \*LL (lateral) » \*NN (nasal) » \*OBSGEM (obstruent). The markedness constraint \*GG, given in (18), must dominate LAZY constraints.



- (18) a. Markedness: \*GG  
 Geminate glides are disallowed.  
 b. \*GG » (LAZY/[+low])<sub>Rime</sub>, LAZY<sub>Syllable</sub>, MAX-IO(+strident)

To rule out the fission of geminates according to which the process applies to only one element of a geminate, I propose the dominating faithfulness constraint GEMINATE INTEGRITY (Schein & Steriade, 1986), as given in (19a), ranked according to (19b).

- (19) a. GEMINATE INTEGRITY  
 Identical segments in the input remain identical in the output.  
 b. GEMINATE INTEGRITY, \*GG » (LAZY/[+low])<sub>Rime</sub>, LAZY<sub>Syllable</sub>, MAX-IO(+strident)

In tableau (6), candidate (b) is ruled out by violating the markedness constraint \*GG. On the other hand, candidates (c) and (d) are ruled out by violating GEMINATE INTEGRITY. Therefore, only the faithful candidate (a) is optimal.<sup>18</sup>

Tableau (6)

Constraint ranking: \*GG, GEMINATE INTEGRITY » (LAZY/[+low])<sub>R</sub>, MAX-IO(+strident), LAZY<sub>S</sub>

/ħadʒdʒi:/	*GG	GEMINATE INTEGRITY	(LAZY/[+low]) <sub>Rime</sub>	MAX-IO(+strident)	LAZY <sub>S</sub>
a. <del>ħadʒ</del> ħadʒdʒi:			*		*
b. ħajji:	*!			**	
c. ħajdʒi:		*!		*	*
d. ħadʒji:		*!	*	*	

#### 4.2.3.3 OCP effects

There are lexical items in which lenition is clearly more frequent. These are exemplified in (20).

<sup>18</sup> Notice that geminated [jj] is permitted in this variety due to IO-faithful mappings.

- (20)
- |    |        |         |                     |
|----|--------|---------|---------------------|
| a. | jda:d  | dʒda:d  | ‘new (pl.)’         |
| b. | ʔajdad | ʔadʒdad | ‘newer’             |
| c. | jdu:d  | dʒdu:d  | ‘grandfather (pl.)’ |
| d. | jdiri: | dʒdiri: | ‘smallpox’          |

Except for (20d), these forms are derived from lexical items in which lenition may freely apply, which are given in (21). The probability of the items given in (20) undergoing lenition is higher than those given in (21). This is due to the fact that in the items in (20), /dʒ/ and /d/ surface strictly adjacent, whereas in (21), these two segments are separated by a vowel.

- (21)
- |    |         |        |               |
|----|---------|--------|---------------|
| a. | dʒidi:d | jidi:d | ‘new’         |
| b. | dʒadd   | jadd   | ‘grandfather’ |

In similar cases, but in which the segments adjacent to [dʒ] is not [d], lenition does not appear to be favored in one form more than in the other.

- (22)
- |    |        |          |        |       |            |
|----|--------|----------|--------|-------|------------|
| BP |        | Singular |        |       |            |
| a. | dʒma:l | jma:l    | dʒimal | jimal | ‘camel’    |
| b. | dʒlu:d | jlu:d    | dʒild  | jild  | ‘skin’     |
| c. | dʒba:l | jba:l    | dʒibal | jibal | ‘mountain’ |

Recall that in section 3.8 above, I suggest that the OCP has a subsidiary effect in the coronal class with respect to the feature [continuant], entailing that there is a co-occurrence restriction between coronal obstruents that do not contrast in [cont], for which the OCP constraint \*([cont]...[cont])<sub>Coronal</sub> given in (§3.7) is held responsible. However, with respect to the items given in (20) and (21), above, the co-occurrence of [dʒ] and [d] is more restricted when these segments are strictly adjacent, as in (20), not as much when separated

by a vowel, as in (21). That is, proximity is playing a role in the OCP restrictions on phonological alternations in Arabic, as is the case for static patterns (see Pierrehumbert, 1993; Frisch et al., 2004; among others). Since the OCP constraint given in (§3.7) above, repeated here as (23) is applicable on sequences with an intervening vowel, as in those in (21), a more restrictive constraint is needed to rule out structures in which [dʒ] and [d] are strictly adjacent. This constraint is given in (24a). Constraint (24a) universally outranks constraint (23) (Suzuki, 1998).

(23) \*([cont]...[cont])<sub>Coronal</sub>

A sequence of obstruents (across an intervening vowel) that do not contrast in [continuant] is prohibited within the coronal place.

(24) a. \*([cont]~[cont])<sub>Coronal</sub>





A sequence of adjacent obstruents that do not contrast in [continuant] is prohibited within the coronal place.

b. \*([cont]...[cont])<sub>Coronal</sub> » \*([cont]~[cont])<sub>Coronal</sub>

Therefore, in addition to LAZY<sub>S</sub>, the faithful mappings of the items in (20) are further rejected by the OCP constraints: \*([cont]~[cont])<sub>Coronal</sub> and \*([cont]...[cont])<sub>Coronal</sub>. However, the faithful mappings of the items given in (21) are only rejected by LAZY<sub>S</sub> and \*([cont]...[cont])<sub>Coronal</sub>, not by \*([cont]~[cont])<sub>Coronal</sub>. But since [dʒ] in (20) is underlyingly present, and because of the influence of SA, in which the cognates of these items surface only with [dʒ], the faithful mappings of the items in (20) may surface, although, only occasionally. This effect can be reached by crucially unranking \*([cont]~[cont])<sub>Coronal</sub> with respect to the constraints governing lenition; MAX-IO(+strident), (LAZY/[+low])<sub>R</sub> and LAZY<sub>S</sub>, as illustrated in tableau (7).

Tableau (7)

Constraint ranking: MAX-IO(+strident), LAZY<sub>S</sub>, (LAZY/[+low])<sub>R</sub>, \*([cont]~[cont])<sub>Coronal</sub> » \*([cont]...[cont])<sub>Coronal</sub>

i. /dʒidi:d/	MAX-IO(+stri.)	LAZY <sub>S</sub>	(LAZY/[+low]) <sub>R</sub>	*([cont]~[cont])	*([cont]...[cont])
a.  jidi:d	*				
b.  dʒidi:d		*			*
ii. /dʒda:d/					
a.  jda:d	*				
b.  dʒda:d		*		*	*

As shown in (ii) of tableau (7), candidate (b) surfaces only if MAX-IO(+strident) outranks both LAZY<sub>S</sub> and \*([cont]~[cont])<sub>Coronal</sub>, a ranking that is possible only one third of the time (33%). That is, candidate (iib) wins only in two rankings: MAX-IO(+strident) » LAZY<sub>Syllable</sub> » \*([cont]~[cont])<sub>Coronal</sub> » \*([cont]...[cont])<sub>Coronal</sub> or MAX-IO(+strident) » \*([cont]~[cont])<sub>Coronal</sub> » LAZY<sub>Syllable</sub> » \*([cont]...[cont])<sub>Coronal</sub>. When one of the other four rankings is adopted, only candidate (ii)a surfaces, which is consistent with the fact that lenition is favored in such structures. In (i), only two rankings are decisive, and each candidate has a 50% chance of winning, since \*([cont]~[cont])<sub>Coronal</sub> is irrelevant in this case.<sup>19</sup>

#### 4.2.4 Lexical exceptions to lenition

Excluding the contexts in which lenition is restricted (§4.2.3), lenition applies only in a subset of the lexical items in which the process may potentially apply. That is, the process applies in certain lexical items but not in others, as illustrated in (25).

- (25) a. dʒaww      jaww      ‘they came’  
       b. ʃadʒam      ʃajam      ‘Persian descendant (pl.)’  
       c. ta:dʒ      ta:j      ‘crown’

<sup>19</sup> There is a similar restriction on the cooccurrence of [dʒ] with the [-anterior] segments, namely, [tʃ] and [ʃ], though it is stronger in the case of [tʃ] since the latter is identical to [dʒ] except for their specification for the feature [voice]. [ʃ], on the other hand, is similar to [d] in that it may only co-occur with [dʒ] if separated by a vowel, as in [dʒe:ʃ] ‘army’. On the other hand, forms in which a historic /dʒ/ occurs strictly adjacent to [ʃ] are lexicalized with [j] in the synchronic grammar of QA (e.g. ʃjara/\*ʃdʒara ‘tree’).

## COMPARE:

d. dʒaww	*jaww	‘atmosphere’
e. hadʒam	*hajam	‘he attacked’
f. ʕila:dʒ	*ʕila:j	‘treatment’

Previous analyses of exceptions to lenition are not totally satisfactory since they are not applicable to the whole set of data (see above, §4.1.2). Below I present three approaches to lexical exceptions within OT. Two of them may account for the case under study; however, only one is pursued here.

## 4.2.4.1 The treatment of lexical exceptions in OT

There are three main approaches within OT to account for lexical exceptions. The first suggests that the lexicon of a language consists of a core, which contains all the native items of the variety that comply with all the phonological generalizations of its grammar, and peripheral areas, which include loanwords at different stages of assimilation which may or may not obey some/all of these generalizations (Ito & Mester, 1995a,b, 1999, 2001). Therefore, the lexicon consists of different strata, with a fixed ranking of the markedness constraints, but a unique ranking of the faithfulness constraints with respect to these markedness constraints in each stratum. As a result of the different rankings of the faithfulness constraints, phonological generalizations fail to apply to items belonging to certain strata, and consequently, lexical exceptions are observed (Yip, 1993; Ito & Mester, 1995a,b, 2001; Davidson & Noyer, 1996; Fukazawa, 1998; Fukazawa, Kitahara & Ota, 1998; Ota, 2004; among others). For a criticism of this approach, the reader is referred to Rice (1997) and Inkelas, Orgun and Zoll (1997).

The second approach for accounting for lexical exceptions employs lexically specific constraint rankings. In this framework, a language is governed by a unique ranking of constraints, and lexical items that display exceptional patterns are governed by different rankings of some of these constraints from that applicable to the rest of the grammar (Ito & Mester, 1999; Pater, 2000; Fukazawa, Kitahara & Ota 1998; Antilla, 2002; among others). The relevant constraints are proposed to be only faithfulness constraints (Fukuzawa 1998;

Kraska-Szelenk 1997, 1999; Itô and Mester 1999) or both faithfulness and markedness constraints (Pater 2000, 2004).

The third approach suggests that lexical exceptions can be accounted for by prespecification (Inkelas, 1994; Roca, 1996; Inkelas & Cho, 1993; Inkelas, Orgun & Zoll, 1996, 1997). That is, a phonological generalization applies to forms that are not lexically specified for a relevant feature, whereas exceptions to this generalization are forms that are lexically specified for this feature. Due to a highly ranked faithfulness constraint, exceptions, which are specified for the relevant feature are mapped faithfully onto the surface. Since non-exceptions are not lexically specified for this feature, the faithfulness constraint is not decisive for promoting the output of these forms, for which a lower ranked constraint (the constraint forcing the generalization or the change) determines the optimal candidate. For case studies in which this approach is applied, the reader is referred to Roca (1996), Inkelas & Cho (1993) and Inkelas, Orgun and Zoll (1997).

An analysis based on lexicon stratification cannot account for the case under study, since exceptions to lenition in QA cannot be distinguished etymologically or otherwise from those items in which the process freely applies. Both native items and loanwords may lenite; both native items and loanwords resist lenition. Therefore, an analysis based on lexicon stratification in which the etymology of an item or the register in which a form surfaces predicts the degree of its compliance with the generalizations that constrain the grammar of the language, is not convenient to account for words that fail to lenite. On the other hand, both lexically specific constraint ranking and prespecification approaches may account for the current data. In an analysis based on lexically specific constraint ranking (e.g. Anttila, 2002), exceptions to lenition must be lexically indexed for a fixed ranking in which MAX-IO(+strident) dominates both LAZY<sub>Syllable</sub> and (LAZY/[+low])<sub>Rime</sub>, so that lenition is always blocked in these forms. Lexical indexing suggests that the indexed items are considered exceptions to an otherwise regular process. In QA, however, items resisting lenition are not felt as exceptional, and native speakers do not have a sense that one set of items is more “natural” or “normal” than the other. Also, lexical indexing fails to account for the fact that lenition applies only to the voiced affricate. Kirchner (2001) suggests that lenition targets the most effortful segments in a language. In a variety of Arabic that includes emphatics and pharyngeals, it is difficult to claim that the voiced affricate is the most effortful segment.

Therefore, if this approach is adopted, the restriction of lenition to /dʒ/ must be stated in the definition of LAZY constraints. In the following section, I explore the notion of prespecification.

#### 4.2.4.2 Lexical exceptions to lenition in QA and prespecification/underspecification

Exceptions to lenition may be accounted for by employing the notion of prespecification, advocated by Inkelas (1994), Roca (1996) and Inkelas, Orgun and Zoll (1997). Accordingly, the instances of /dʒ/ that resist lenition are specified in the lexicon as having the feature [-cont], unlike those that may variably undergo lenition, which are underspecified for this feature.<sup>20</sup> By having the faithfulness constraint in (26a) highly ranked, the correct result is obtained.

(26) a. Faithfulness: MAX-IO(cont)

Every [cont] specification in the input is present in the output.

b. MAX-IO(cont) » MAX-IO(+strident), LAZY<sub>Syllable</sub>, (LAZY/[+low])<sub>Rime</sub>




Constraint (26a) needs to outrank the basic constraints governing lenition, as illustrated in tableau (8). Uppercase /dʒ/, that is, /DZ/ is used to indicate underspecification for the feature [cont]. In (i), since the input /DZ/ is unspecified for the feature [cont], neither candidate (a) nor (b) violate the faithfulness constraint MAX-IO(cont) (Inkelas, Orgun & Zoll, 1997). Both candidates are optimal because the basic constraints governing lenition are unranked with respect to each other. In (ii), On the other hand, as a result of having /dʒ/ specified as [-cont], only candidate (b) violates the faithfulness constraint MAX-IO(cont). This makes the faithful candidate (a) optimal.<sup>21</sup>

<sup>20</sup> It is worth mentioning that in Arabic, the feature [cont] is not contrastive for the realization of /dʒ/. /dʒ/ contrasts with the [-anterior] segments /tʃ/ and /ʃ/ in voicing. It contrasts with emphatic coronals in [RTR] and with all the other segments in place. This is consistent with the fact that in a number of modern varieties of Arabic, such as those spoken in North Africa (except Egypt) and most of the Levant (§4.1), the reflex of standard Arabic [dʒ] is a [+cont] segment, that is [ʒ], which may indicate that Arabic /dʒ/ is generally underspecified for the feature [cont] (thanks to Elan Dresher (p.c.) for raising this issue).

<sup>21</sup> To rule out a mapping in which /dʒ/ surfaces as [g], in an item such as [dʒidir] ‘cooking pot’, in which lenition is blocked due to prespecification and [dʒ] surfaces in a context violating the OCP constraint

Tableau (8)

Constraint ranking: MAX-IO(cont)» MAX-IO(+strident), LAZY<sub>Syllable</sub>, (LAZY/[+low])<sub>Rime</sub>

i.	/DZa/	MAX-IO(cont)	MAX-IO(+strident)	LAZY <sub>Syllable</sub>	(LAZY/[+low]) <sub>Rime</sub>
a.	 dʒa			*	
b.	 ja		*		
ii.	/wa:dʒib/				
a.	 wa:dʒib			*	
b.	wa:ʒib	*!	*		

#### 4.2.5 Paradigmatic effects

##### 4.2.5.1 Nouns and adjectives


Generally, inflectionally related nouns/adjectives follow their bases with respect to lenition. If the base undergoes lenition, so do the inflected forms. If, on the other hand, the process is blocked in the base, it is also blocked in the inflected forms (for paradigmatic effects, the reader is referred to §3.5 and references therein).

Although lenition is blocked in the forms listed in the first column in (27), by MAX-IO(+strident) outranking LAZY<sub>Rime</sub>, there is no contextual restriction on the process in the inflected forms (second column).

(27)	Base		Inflected	
a.	go:dʒ	‘plums’	go:dʒ-a	‘a plum’
b.	mo:dʒ	‘wave’	mo:dʒ-a	‘a wave’
c.	θaldʒ	‘ice, snow’	θaldʒ-a	‘his ice’

\*[cont] ~ [cont]<sub>coronal</sub>. I suggest that a faithfulness constraint militating against deletion of a coronal place, MAX-IO(coronal), must dominate the constraints governing lenition, as illustrated in the tableau below (i). Otherwise, [g] would be optimal under the ranking in which \*[cont] ~ [cont]<sub>C</sub> dominates both MAX-IO(+strident) and LAZY<sub>Syllable</sub>.

(i)

/dʒidir/	MAX-IO(cont)	MAX-IO(coronal)	*[cont] ~ [cont] <sub>C</sub>	MAX-IO(+strident)	LAZY <sub>S</sub>
a.  dʒidir			*		*
b. jidir	*!			*	
c. gidir		*!		*	*



d. ɸaldʒ	‘mouth’	ɸaldʒ-a	‘his mouth’
e. ɸati:dʒ	‘old’	ɸittadʒ	‘old (pl.)’
f. ɸidʒra	‘room’	ɸdʒar	‘rooms’

This outcome is due to an OO-faithfulness constraint that militates against the deletion of the feature [+strident] in inflectionally related forms (McCarthy & Prince, 1995). For a discussion of such constraints, the reader is referred to §3.5 and references therein. This constraint is defined in (28a), ranked according to (28b).

(28) a. Faithfulness: MAX-OO(+strident)



Every [+strident] specification in a base form is present in derived forms.

b. MAX-OO(+strident) » (LAZY/[+low])<sub>R</sub>, LAZY<sub>S</sub>, MAX-IO(+strident) » LAZY<sub>R</sub>

In tableau (9), the base candidate (i)b violates the faithfulness constraint MAX-IO(+strident), therefore, candidate (i)a is optimal. In (ii), on the other hand, the constraints governing lenition are not decisive. Therefore, by violating MAX-OO(+strident), candidate (b) is ruled out, which makes candidate (a) optimal.

Tableau (9)

Constraint ranking: MAX-OO(+strident), (LAZY/[+low])<sub>Rime</sub>, LAZY<sub>S</sub>, MAX-IO(+strident) » LAZY<sub>R</sub>

i. /mo:dʒ/	MAX-OO(+stri.)	(LAZY/[+low]) <sub>R</sub>	LAZY <sub>S</sub>	MAX-IO(+stri.)	LAZY <sub>R</sub>
a.  mo:dʒ					*
b. mo:j				*!	
ii. /mo:dʒ-a/					
a.  mo:dʒ-a			*		
b. mo:j-a	*!			*	

Furthermore, when the base of a paradigm undergoes lenition, the inflected forms also undergo the process. This is exemplified in (29) and illustrated in tableau (10).<sup>22</sup>

(29)	Base		BP
a.	dʒibal/jibal	‘mountain’	dʒba:l/jba:l
b.	dʒimal/jimal	‘camel’	dʒma:l/jma:l
c.	dʒaras/jaras	‘bell’	dʒra:sa/jra:sa
d.	ʔadʒwidi:/ʔajwidi:	‘kind, generous’	ʔadʒa:wi:d/ʔaja:wi:d

Tableau (10)

Constraint ranking: MAX-OO(+strident) » (LAZY/[+low])<sub>R</sub>, LAZY<sub>S</sub>, MAX-IO(+strident)





i. /dʒibal/	MAX-OO(+strident)	(LAZY/[+low]) <sub>R</sub>	LAZY <sub>S</sub>	MAX-IO(+strident)
a.  dʒibal			*	
b.  jibal				*
ii. /dʒba:l/				
a.  dʒba:l			*	
b.  jba:l				*

Tableau (10) demonstrates that lenition applies freely to both the base and the inflected form in these paradigms. Notice that the faithfulness constraint MAX-OO(+strident) is not applicable to the base in nominal/adjectival paradigms since the domain of this constraint is restricted to inflected forms. Because each candidate in (ii) is faithful to one of the variants of the base, neither of them violates MAX-OO(+strident), and consequently both are optimal.

If the application of lenition to an inflected form creates a structure that violates higher ranked constraints, then, lenition is blocked (although only in that inflected form). In (30), both the base and the dual forms undergo lenition. The process is blocked, however, in




<sup>22</sup> The only two exceptions are [ti:dʒa:n] ‘crowns’ and [ʔadʒniha] ‘wings’, which unlike their singular bases [ta:dʒ/ta:j] and [dʒana:h/jana:h], respectively, resist lenition. This is definitely due to the fact that these plural forms are learned items, therefore, they are lexically prespecified as [-cont] (see §4.2.4.2, for items resisting lenition). A more frequent plural form of [dʒana:h] is [dʒinha:n], to which lenition freely applies, therefore, [jinha:n].

the plural form since its application violates the dominating markedness constraint \*GG. This is demonstrated in tableau (11).

- (30) a. ta:dʒir      ta:jir      ‘merchant, rich’  
       b. ta:dʒire:n    ta:jire:n      ‘merchant, rich (dual)’  
       c. tidʒdʒa:r    \*tija:r      ‘merchant, rich (pl.)’

Tableau (11)

Constraint ranking: \*GG, MAX-OO(+strident) » (LAZY/[+low])<sub>R</sub>, MAX-IO(+strident), LAZY<sub>S</sub>

i. / ta:dʒir /	*GG	MAX-OO (+strident)	(LAZY/[+low]) <sub>R</sub>	MAX-IO (+strident)	LAZY <sub>S</sub>
a.  ta:dʒir					*
b.  ta:jir				*	
ii. /tidʒdʒa:r/					
a.  tidʒdʒa:r					*
b. tija:r	*!			**	

#### 4.2.5.2 Verbs

Unlike affrication, lenition applies to the category of verbs, which is exemplified in (31).

- (31) a. dʒa:b      ja:b      ‘to bring’  
       b. ndʒiraḥ    njiraḥ      ‘to be wounded’  
       c. dʒa      ja      ‘to come’  
       d. dʒabbar    jabbar      ‘to splint (broken bones)’  
       e. dʒarr      jarr      ‘to pull’  
       f. dʒarrab    jarrab      ‘to try’  
       g. dʒawwaʕ    jawwaʕ      ‘to starve (transitive)’  
       h. dʒa:war    ja:war      ‘to sit beside, be a neighbor of’

When lenition applies in a certain paradigm, all the members of that paradigm undergo the process, unless the application of lenition violates a contextual restriction in a certain form. In this case, the process is blocked, but only in the offending forms (underlined), which is demonstrated in (32).

(32)	dʒirah/jirah	'to wound'		
	dʒirhat/jirhat	dʒirhaw/jirhaw	dʒiraht/jiraht	dʒirahtaj/jirahtaj
	dʒirahtaw/jirahtaw	dʒiraht/jiraht	dʒiraḥna/jiraḥna	<u>jidʒrah/*jijrah</u>
	<u>tidʒrah/*tijrah</u>	<u>jidʒrihu:n/*jijrihu:n</u>	<u>tidʒrah/*tijrah</u>	<u>tidʒrihi:n/*tijrihi:n</u>
	<u>tidʒrihu:n/*tijrihu:n</u>	ʔadʒrah/ʔajrah	<u>nidʒrah/*nijrah</u>	dʒrah/jrah
	dʒirhaj/jirhaj	dʒirhaw/jirhaw	dʒa:riḥ/ja:riḥ	dʒa:rha/ja:rha
	dʒa:rhi:n/ja:rhi:n	dʒarḥ/jarḥ	madʒru:ḥ/majru:ḥ	
	madʒru:ḥa/majru:ḥa			
	madʒru:ḥi:n/majru:ḥi:n			

The fact that the members of paradigms such as those in (32) do not pattern in an identical way indicates the low ranking of a constraint enforcing unity among verbal paradigms with respect to lenition (33a). This is shown in tableau (12).

(33) a. Faithfulness: MAX-OP<sup>23</sup>(+strident)

A dorsal specification in a member of an inflectional paradigm is present in every other member of that paradigm.

b. (LAZY/[+low])<sub>R</sub>, MAX-IO(+strident), LAZY<sub>S</sub> » LAZY<sub>R</sub>, MAX-OP(+strident)



Unlike the case with nouns and adjectives, in verbal paradigms, there is not a certain base with which the inflected forms need to conform (see above §3.5.3). All the members of

<sup>23</sup> For more on Optimal Paradigms, see §3.5.3 and McCarthy, 2005.

verbal inflectional paradigms are equal as predicted by the Optimal Paradigms model proposed by McCarthy (2005). Accordingly, each member of a verbal paradigm is compared to each other member of that paradigm. This motivates the distinction between MAX-OO(+strident) in (28a) and MAX-OP(+strident) in (33a).

Tableau (12)

Constraint ranking: (LAZY/[+low])<sub>R</sub>, MAX-IO(+strident), LAZY<sub>S</sub> » MAX-OP(+strident)



/dzirah, jidzrah/	(LAZY/[+low]) <sub>R</sub>	LAZY <sub>S</sub>	MAX-IO (+strident)	MAX-OP (+strident)
a.  dzirah, jidzrah		*		
b.  jirah, jidzrah			*	**
c. dzirah, jirah		*	*!	**
d. jirah, jirah			**!	

In tableau (12), each candidate consists of a whole inflectional paradigm, and the members of each candidate are evaluated simultaneously. In addition, the violations incurred by the members of a given paradigm are added up together. Candidate (c) is ruled out by violating both LAZY<sub>S</sub> and the faithfulness constraint MAX-IO(+strident). Candidate (d) is ruled out by incurring two violations to MAX-IO(+strident), consequently, only candidates (a) and (b) are optimal.

The same ranking may account for paradigms in which all the members may undergo lenition, as shown in tableau (13).

Tableau (13)

Constraint ranking: MAX-IO(+strident), LAZY<sub>S</sub>, (LAZY/[+low])<sub>R</sub> » MAX-OP(+strident)

/ndzirah, ndzarhat /	MAX-IO (+strident)	LAZY <sub>S</sub>	(LAZY/[+low]) <sub>R</sub>	MAX-OP (+strident)
a.  ndzirah, ndzarhat		**		
b.  njirah, njarhat	**			
c. ndzirah, njarhat	*	*!		**
d. njirah, ndzarhat	*	*!		**

In tableau (13), candidate (a) is optimal when the faithfulness constraint MAX-IO(+strident) outranks LAZY<sub>S</sub>. When the opposite ranking takes place, only candidate (b) is optimal. Candidates (c) and (d) are ruled out since they violate the dominant constraint in each of the two rankings.

As in the case of affrication, the data indicate that we need two mechanisms to account for the interaction between paradigmatic effects and lenition. Nominal/adjectival paradigms, which have bases, are subject to an OO-faithfulness constraint. Since verbal paradigms lack bases, they must be subject to the OP model (McCarthy, 2005).

### 4.3 A residual Issue: The typology of lenition vs. Lenition of /dʒ/ in QA

In his survey of different types of lenition in different languages, Kirchner (2001, 2004) finds a number of generalizations that are found to be applicable to most of these cases. Those generalizations that are relevant to the current study are discussed below.

- *Lenition applies mostly to effortful segments*

This proposal presupposes that the need to lenite more effortful segments is stronger than the need to lenite less effortful segments, with strident affricates being the most effortful and non-strident fricatives the least, among consonants (Kirchner, 2001, p. 92). Strident affricates may be the most effortful segments in the languages surveyed by Kirchner. In QA, however, a variety that includes emphatic obstruents, which have two points of articulation, it is not obvious whether or not this generalization holds. This claim can only be confirmed or refuted by an experimentally based study, which is left for future research.

- *Lenition is widely attested in intervocalic position*

It is suggested in the literature that lenition is mostly triggered in intervocalic positions (Bauer, 1988; Lavioe, 2000; Kirchner, 2001, 2004, and references therein). Although in QA the process is not favorably triggered in this position (although a variationist study might reveal statistical tendencies), there is also no restriction on lenition in this context.

- *Onset vs. coda*

It is suggested in the literature (see e.g., Kirchner, 2001, 2004, and references therein) that in

addition to intervocalic position, lenition typically applies in the coda position. In QA, however, lenition applies predominately in the onset position, part of a general asymmetry in the phonotactics of this variety, which tolerates more variation in the onset than the coda (§4.2.3.1).

It should be noted, however, that Kirchner's (2001) typological study includes a number of languages in which lenition also applies in the onset position, only in the onset position (conditioned by a following vowel), or in word initial position, as listed below.

- (34)
- s >h/\_V in ancient Greek.
  - t >s/ V\_i in ancient Greek.
  - b >β, d >ɾ, g >ɣ/\_V (non-initial) in Efik.
  - v > w /\_V (and in coda) in Georgian.
  - P >b /\_V in Gitskan.
  - Fortis stops may be allophones of lenis (voiced) stops in initial or final position in Gojri.
  - P >h word initially in Kannada.
  - W > ø/\_V -high in Korean.
  - b,d,g > β,ɾ,ɣ/ -cons (#)\_\_\_, (word initially) in Lowland Murut.
  - Stop > voi /\_\_\_V in Mohawk.
  - h > ø word-initially in Pawnee.
  - Pf > p/\_\_\_V in Pennsylvania German.
  - d >l /\_\_\_ [-high] V in Sotho.
  - t >s/\_\_\_V [-back] in Turkana.
  - G > Â/V\_\_\_V (and word initially) in Uyghur.
  - Partly voice neutral stops before V in Yana. (Kirchner, 2001, p.231-244)
  - d' > l/\_\_\_V [+low] in Tsou. (Kirchner, 2001, p. 159)

- *Adjacent segments with wider strictures are more capable of triggering lenition*

This generalization indicates that lenition is mostly triggered when adjacent to segments with open strictures, that is, [+son] segments (Kirchner, 2001, p. 137), with low vowels

being the most capable of inducing the process and geminate consonants the least (p. 150).<sup>24</sup> This generalization holds for lenition in QA, where the process is restricted by adjacency to low vowels, when in a coda position.

In addition to the characteristics discussed above, lenition in QA complies with the generally observed pattern of lenition processes with respect to geminates. That is, in QA, as in other cases documented in the literature (Kirchner, 2000, 2001) lenition is blocked in geminates. Further, as found in other cases discussed in the literature (Kirchner, 2001, 2004), lenition in QA is promoted in fast and casual speech and disfavored in slow and formal speech (Al-amadidhi, 1985).

#### 4.4 Conclusion

Lenition in QA never applies:

1. When /dʒ/ is in the coda, preceded by a segment other than a low vowel.
2. To geminates.
3. When /dʒ/ is prespecified as [-cont].
4. To inflected forms whose bases resist the process due to 1, 2 or 3.

Lenition applies freely otherwise and it is highly favored when motivated by avoidance of violation of the OCP constraint \*([cont]~[cont])<sub>Coronal</sub>.

#### *Constraint ranking summary*

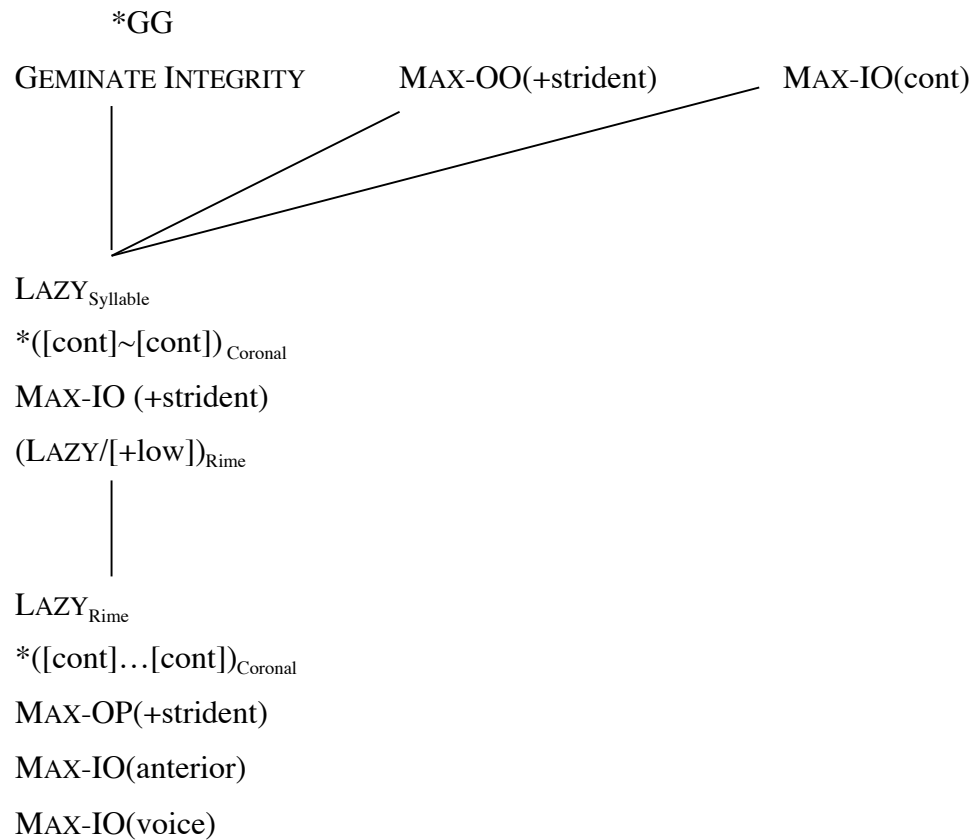
A number of constraints are proposed in this chapter. These constraints are summarized in (35).

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<sup>24</sup> Kirchner's hierarchy is as follows: low V > mid V > high V > liquids > nasals > stops > strident fricatives >....full or partial geminates.



(35)



In this chapter, an analysis is provided for the lenition of /dʒ/ in QA, within the framework of OT (Prince & Smolensky, 2004). Following Hock (1991) and Kirchner (2001, 2004), I consider lenition in QA to be driven by an imperative to minimize articulatory effort, therefore, LAZY. This option however, is only available to /dʒ/, since it is the only segment that is underspecified in the lexicon for the feature [cont]. Unlike affrication, lenition applies to all syntactic categories. I suggest that the lenition of /dʒ/ is not totally context free, since although it is unrestricted in onset position, it applies only after low vowels in coda position. This positional restriction is consistent with general phonotactics of QA, which permit more varying sequences in the onset position. Further, lenition is blocked in geminates, a restriction that is found to hold universally (Kirchner, 2000; Lavoie, 2000), due here to the markedness of geminate glides (Kawahara, to appear). On the other hand, I suggest that lenition is highly favored in contexts in which a faithful mapping of the underlying representation violates the OCP constraint \*([cont]~[cont])<sub>Coronal</sub>. Lexical exceptions to

lenition are accounted for by having them prespecified in the lexicon as [-cont], unlike forms that may undergo lenition, which are not specified for this feature. An alternative analysis, which is based on lexically specific constraint ranking, is also shown to account for these exceptions. Paradigmatic effects are responsible for blocking lenition in inflected nouns and adjectives whose bases resist the process. In verbal paradigms, such effects are obtained without resorting to paradigmatic constraints. This indicates that nouns/adjectives are subject to a paradigmatic constraint that is different from the one verbs are subject to. This patterning is attributed to the fact that verbal paradigms lack bases. Finally, I compare lenition in QA to the general characteristics of lenition processes documented in the literature.

## 5. CONCLUSION

In this thesis, I propose novel analyses for two variable phonological processes that are exhibited in Arabic, as represented in Qatari Arabic. These processes are the affrication of the velar stops [k] and [g] to [tʃ] and [dʒ], and the lenition of [dʒ] to [j].

First I argue for the inclusion of the segments [tʃ] and [g] in the phonemic inventory of QA. Based on this assumption I analyze the process of affrication of the velar stops [k] and [g]. I find that in synchronic QA, affrication can only be triggered by adjacency to high front vowels. Adjacency to other segments, including front vowels other than [i(:)], blocks the process. The variability of the process in QA is confirmed since both [k] and [tʃ] may surface when adjacent to [i(:)], so do [g] and [dʒ]. The domain of affrication is suggested to be the stem; therefore, segments occurring outside this domain have no effect on the process, and only internal modifications to the stem may block the process. Paradigm uniformity effects are responsible for inhibiting affrication in broken plurals, verbs, participles and verbal nouns. However, the data suggest that verbal paradigms are subject to an OP-faithfulness constraint, unlike nominal/adjectival paradigms, in which a regular OO-faithfulness constraint is operative. This is due to the fact that verbal paradigms, but not nominal/adjectival paradigms, lack bases. The distinct paradigmatic patterning of these two types of paradigms with respect to affrication provides further support for the OP model.

Affrication is generally blocked by co-occurrence with emphatic segments, which is reported to be the case in other varieties of Arabic as well (Cantineau, 1936; Maṭar, 1969, 1985; Johnstone, 1978). This is a natural outcome of emphasis spread, which retracts/lowers the vowels in the vicinity of emphasis, with directional and scope limitations. When /i/ surfaces retracted/lowered, it fails to trigger affrication. In addition, I suggest that affrication is blocked when the outcome would incur a violation to the OCP. Apparent counterexamples to my proposal are discussed. These consist of cases of alternation between [dʒ] and [tʃ] in the context of segments other than [i(:)]. I argue that these cases involve doublets, not affrication. This position is justified by the distinct behavior these items demonstrate compared to cases of unambiguous affrication. The process of affrication in QA exemplifies

an extraordinary case where a phonological process is affected by different grammatical levels. The process is influenced by the phonetic representation of the relevant segments on the one hand, and by the morphological relations between words on the other. Between these two ends, the process also interacts with other phonological factors that are operative in the variety.

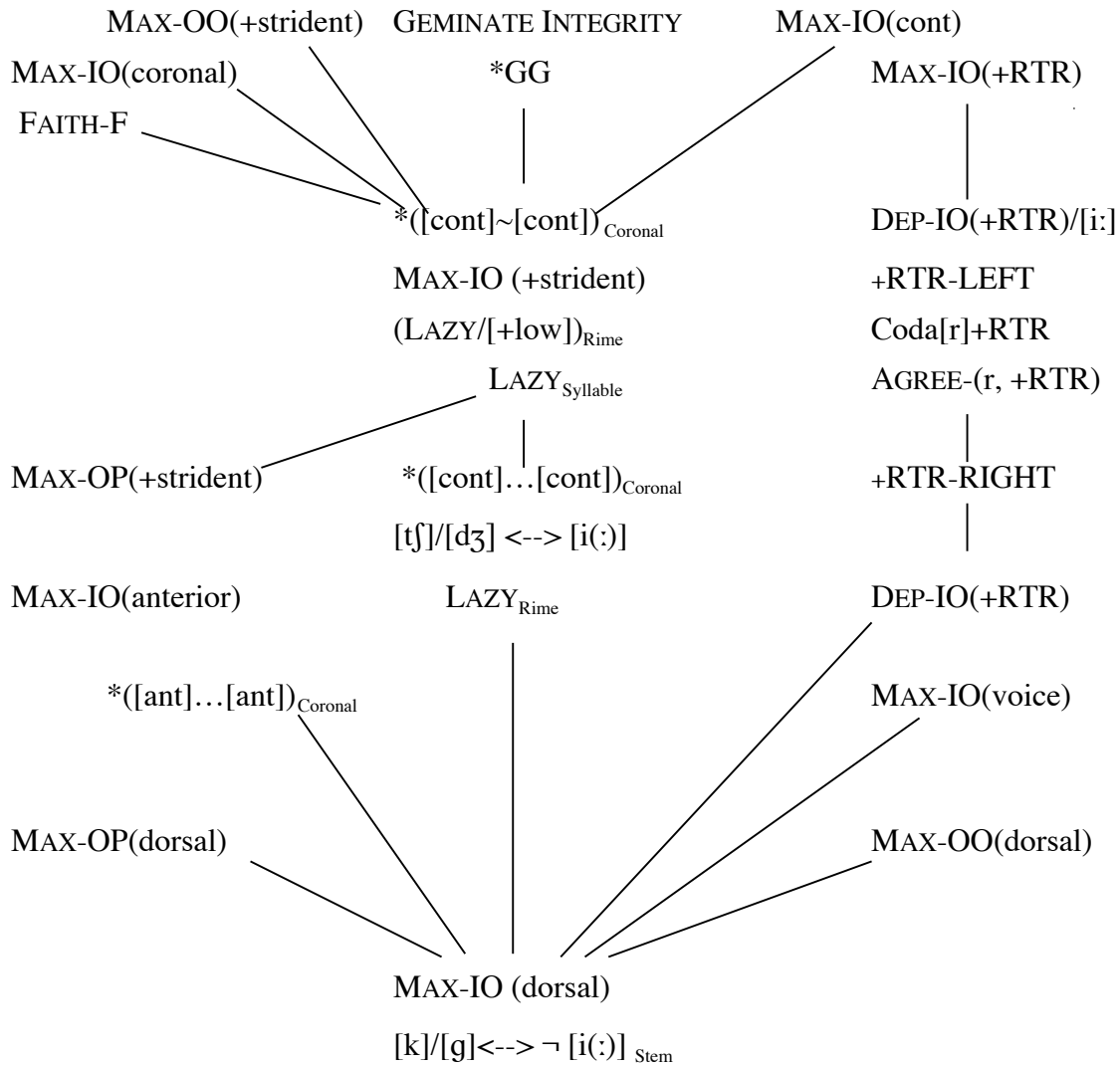
With respect to lenition, I suggest that the lenition of [dʒ] to [j] is motivated by an effort minimizing constraint. Although the alternation between [dʒ] and [j] seems to be generally free, I find that there are positional restrictions on the process such that lenition applies more freely in the onset as compared to the coda position, where it only applies after low vowels. This contextual restriction is consistent with the cross-linguistic generalization that lenition is favored in the context of segments with a wide aperture. In addition, lenition never applies to geminates, which is due to the markedness of geminate glides. Lenition is found to be favored in contexts in which a faithful mapping of the underlying representation violates the OCP. On the other hand, since lenition does not apply in all the items in which it is potentially possible for it to apply, I suggest that there are two instances of /dʒ/ in the lexicon of QA: one undergoes lenition by virtue of being underspecified for the feature [continuant], the other one is specified as [-continuant] and resists lenition. Further, I find that there is a morphological restriction on the process according to which the members of each nominal/adjectival and also verbal paradigm pattern identically with respect to lenition, unless the process is blocked in a certain item by dominating constraints.

Since the affricate [dʒ] is a common output for affrication and lenition, it is necessary to establish a constraint ranking that accounts for the outputs of both processes. The final constraint ranking for both affrication and lenition in QA is given in (1). The constraints that are listed together are either crucially unranked with respect to each other, as in the case of the basic constraints governing affrication and lenition, or their ranking could not be established or is not crucial to the analyses developed here. Notice that the faithfulness constraint: MAX-IO(anterior) does not need to be specially ranked with any constraint.

While this constraint ranking accounts for both affrication and lenition in QA, it is possible that in other varieties of Arabic that exhibit these alternations the same constraints are differently ranked, since these varieties differ, to some extent, in the conditions under

which these processes apply. A cross-dialectal investigation of affrication and lenition is left for future research.

(1)



It is noteworthy that the processes of affrication and lenition in QA exemplify cases of language change in progress, in part due to the increased influence of SA and contact with other contemporary varieties of Arabic. Since these two processes are exhibited neither in SA nor in many other varieties of Arabic that are in constant contact with QA, there is a growing tendency among speakers of QA to avoid affrication and lenition, especially among younger speakers of the variety (Al-amadidhi, 1985). It is possible that within a few decades

affrication and lenition cease to be productive processes in the grammar of QA. Consequently, the change will lead to the disappearance of variants surfacing with the affricates or the glide. Flikeid (1989, 191-192) makes similar comments about affrication in Acadian French, which is regarded as a stigmatized local feature and is therefore frequently avoided.

The current study has shown that in QA the OCP is not merely a restriction on distributional patterns; rather, it is also an active constraint that restricts synchronic alternations. In addition to segmental alternations, if the OCP is synchronically an active constraint, its effect should be evidenced in loanword adaptation. This issue is worth exploring but is left for future research. More generally, the role of the OCP in the application of affrication and lenition in QA should lead to a cross-dialectal investigation of its effect in different processes and varieties in Arabic.

The distinct patterning of verbal paradigms and nominal/adjectival paradigms indicates the existence of two mechanisms of paradigmatic effects. In case of the availability of a base, as in nominal/adjectival paradigms, a regular OO-faithfulness is sufficient. However, the study has shown the necessity of the OP model to handle inflectional paradigms that lack bases, such as Arabic verbal paradigms.

Another area of the phonology of Arabic dialects that needs further research is emphasis spread (pharyngealization) in terms of scope, direction, the affected segments, and those blocking the process. Although a number of experimental studies have addressed these issues in different varieties of Arabic, more data and subjects need to be examined. In addition to the underlyingly emphatic segments, segments that only contextually surface emphatic (e.g. [b, f, m, l, r] in QA) deserve a special attention. We need to know the nature and the scope of the emphasis of these segments and to what extent they induce backing/lowering in the flanking segments.

Finally, although not addressed here, an additional case of lenition/fortition in Arabic is the alternation between [q] and [ɣ], which is suggested in the literature to be context free, and which is not restricted to the varieties of Gulf Arabic. This alternation needs to be phonologically studied in QA and in other varieties of Arabic.

## APPENDICES

### Appendix A: List of Constraints

Name and definition	Section in which the constraint is introduced
<b>Faithfulness constraints:</b>	
<b>FAITH-F</b> Output correspondents of an input [ $\alpha$ F] segments are also [ $\alpha$ F]. (Correspondent segments in input and output have identical values for [voice], [high] and [cont]).	(§3.4)
<b>MAX-IO(dorsal)</b> Every [dorsal] specification in the input is present in the output.	(§3.4)
<b>MAX-IO(+RTR)</b> Every [+RTR] specification in the input is present in the output.	(§3.6.2)
<b>MAX-IO(+strident)</b> Every [+strident] specification in the input is present in the output.	(§4.2.2)
<b>MAX-IO(voice)</b> Every [voice] voice specification in the input is present in the output.	(§4.2.2)
<b>MAX-IO(anterior)</b> Every [anterior] specification in the input is present in the output.	(§4.2.2)
<b>MAX-IO(continuant)</b> Every [continuant] specification in the input is present in the output.	(§4.2.4.2)
<b>MAX-IO(coronal)</b> Every [coronal] specification in the input is present in the output.	(§4.2.4.2)
<b>DEP-IO(+RTR)</b> Every [+RTR] specification in the output is present in the input.	(§3.6.2)
<b>DEP-IO(+RTR)/[i:]</b> Do not insert a [+RTR] specification to an input [i:].	(§3.6.2)
<b>MAX-OO(dorsal)</b> Every [dorsal] specification in a base form is present in derived forms.	(§3.5.1)
<b>MAX-OO(+strident)</b> Every [+strident] specification in a base form is present in derived	(§4.2.5.1)



forms.	
<p>MAX-OP(dorsal)</p> <p>A [dorsa] specification in a member of an inflectional paradigm is present in every other member of that paradigm.</p>	(§3.5.3)
<p>MAX-OP(+strident)</p> <p>A [+strident] specification in a member of an inflectional paradigm is present in every other member of that paradigm.</p>	(§4.2.5.2)
<p>GEMINATE INTEGRITY</p> <p>Identical segments in the input remain identical in the output.</p>	(§4.2.3.2)
<b>Markedness constraints:</b>	
<p>[k]/[g] &lt;--&gt; ¬ [i(:)]</p> <p>[k]/[g] occur adjacent to a segment other than [i(:)].</p>	(§3.3)
<p>[k]/[g] &lt;--&gt; ¬ [i(:)]<sub>Stem</sub></p> <p>[k] and [g] occur adjacent to segments other than [i(:)] within the stem.</p>	(§3.4.2)
<p>[tʃ]/[dʒ] &lt;--&gt; [i(:)]</p> <p>[tʃ] and [dʒ] are adjacent to [i(:)].</p>	(§3.5.3)
<p>+RTR-LEFT</p> <p>Align([+RTR], Left, Word, Left)</p> <p>In words containing one of the segments [t<sup>ɿ</sup>, s<sup>ɿ</sup>, ð<sup>ɿ</sup>, l<sup>ɿ</sup>], a [+RTR] feature is aligned with the left edge of the word.</p>	(§3.6.2)
<p>+RTR-RIGHT</p> <p>Align([+RTR], Right, Word, Right)</p> <p>In words containing one of the segments [t<sup>ɿ</sup>, s<sup>ɿ</sup>, ð<sup>ɿ</sup>, l<sup>ɿ</sup>], a [+RTR] feature is aligned with the right edge of the word.</p>	(§3.6.2)
<p>Coda[r]+RTR</p> <p>[r] surfaces as [+RTR] in coda position.</p>	(§3.6.3)
<p>AGREE-(r, +RTR)</p> <p>A segment adjacent to a [+RTR] [r] is also [+RTR].</p>	(§3.6.3)

<p>*([ant]...[ant])<sub>Coronal</sub>  A sequence of obstruents (across an intervening vowel) that do not contrast in [anterior] is prohibited within the coronal place.</p>	(§3.7)
<p>*([cont]...[cont])<sub>Coronal</sub>  A sequence of obstruents (across an intervening vowel) that do not contrast in [continuant] is prohibited within the coronal place.</p>	(§3.7), (§4.2.3.3)
<p>*([cont]~[cont])<sub>Coronal</sub>  A sequence of adjacent obstruents that do not contrast in [continuant] is prohibited within the coronal place.</p>	(§4.2.3.3)
<p>LAZY  Segments are articulated lazily.</p>	(§4.2.2)
<p>LAZY<sub>Rime</sub>  A consonant dominated by a rime node is articulated lazily.</p>	(§4.2.3.1)
<p>(LAZY/[+low])<sub>Rime</sub>  If a consonant C is adjacent to a low vowel, and both segments are dominated by a rime node, then C is articulated lazily.</p>	(§4.2.3.1)
<p>LAZY<sub>Syllable</sub>  A consonant dominated directly by a syllable node is articulated lazily.</p>	(§4.2.3.1)
<p>*GG  Geminate glides are disallowed.</p>	(§4.2.3.2)

## Appendix B

Although QA was previously investigated from different linguistic perspectives (Johnstone, 1967; Bukshaisha, 1985; Al-amadidhi, 1985; Al-Sulaiti, 1993), the current study provides an unprecedented amount of data of this variety. These data were partly extracted from a dictionary that is based on the colloquial Arabic of the Gulf region (Qafisheh, 1996). Caution was taken however to include only those lexical items that belong to QA, since although the Arabic varieties spoken in the Gulf share a great number of characteristics, they differ from each other in certain aspects of the grammar, including vocabulary and the scope of application of phonological processes. The intuition of the author and of twelve other native speakers of the variety was used to make this distinction. These data were complemented by additional data provided by the author and these native speakers.

Every lexical item that belongs to QA and contains [g] or [dʒ] was included. In the case of [j], since it surfaces in this variety as an output of /dʒ/ or /j/, care was taken to include only the items in which [j] is the output of /dʒ/, whether in the synchronic or diachronic grammar of QA. Any item that surfaces variably with [j] and [dʒ] was included. If an item surfaces in QA invariably with [j], but in another variety with both [j] and [dʒ], or only with [dʒ], it was also included and classified as a non-alternating item.

Recent borrowings, such as those from English and French are excluded. Old borrowings, on the other hand, which include lexical items from Hindi, Turkish, Farsi are included since they pattern with the native vocabulary with respect to the phonological processes observed in the variety. For example, these items from Farsi have undergone lenition and affrication and now lexicalized with the resulting sound.

Original form		Lexicalized in QA	
[dʒift]	>	[jift]	‘an ointment used by divers’
[hamki:]	>	[hamtʃɛ]	‘a handful’

The items are listed according to the Arabic alphabet order, with /tʃ/ following /dʒ/ and /g/ substituting /q/. Doublets are given separate entries. Derivationally related forms are listed separately, whereas inflectionally related forms are listed together. Nominal/adjectival inflectional paradigms are listed according to the first sound of the base form, which is usually the singular masculine form, except in a few nominal paradigms where the collective noun is the base.

Verbal paradigms are listed according to the first segment of the 3<sup>rd</sup> person singular masculine perfective form in the following order:

- 3<sup>rd</sup> person singular masculine perfective form.
- 3<sup>rd</sup> person singular feminine perfective form (suffixed by [-at]).
- 3<sup>rd</sup> person plural perfective form (suffixed by [-aw]).
- 2<sup>nd</sup> person singular masculine perfective form ([t]).
- 2<sup>nd</sup> person singular feminine perfective form ([taj]).
- 2<sup>nd</sup> person plural perfective form ([taw]).
- 1<sup>st</sup> person singular perfective form (suffixed by [-t]).
- 1<sup>st</sup> person plural perfective form ([na]).
- 3<sup>rd</sup> person singular masculine continuant form ([j-]).
- 3<sup>rd</sup> person singular feminine continuant form ([t-]).

- 3<sup>rd</sup> person plural continuant form ([j-stem-u:n/o:n]).
- 2<sup>nd</sup> person singular masculine continuant form ([t-]).
- 2<sup>nd</sup> person singular feminine continuant form (t-stem-i:n/e:n).
- 2<sup>nd</sup> person plural continuant form ([t-stem-u:n/o:n]).
- 1st person singular continuant form ([ʔa-]).
- 2<sup>nd</sup> person plural continuant form ([n-]).
- 2<sup>nd</sup> person singular masculine imperative form.
- 2<sup>nd</sup> person singular feminine imperative form ([-aj]).
- 2<sup>nd</sup> person plural imperative form ([-aw]).
- Singular masculine active participle form.
- Singular feminine active participle form.
- Plural active participle form.
- Verbal Noun.
- Singular masculine passive participle form.
- Singular feminine passive participle form.
- Plural passive participle form.

Beside affixation, however, the vocalic pattern of the stem may also change in these verbal forms. It is worth mentioning that in QA, some verbal nouns may differ than those used in SA/CA: e.g. the verbal noun of [kajjal] ‘to weigh (transitive)’ is [ke:l] not [takji:l].

The verbal pronominal suffixes that end in [j] may variably surface as [-i:]. This process is obligatory, when followed by the accusative and genitive suffixes. The pronominal morphemes ending in [w] variably surface as [-u:]. When the perfective 3<sup>rd</sup> person plural morpheme [-aw] is followed by the accusative and genitive morphemes, it obligatorily surfaces as [o:]. In the same context, the imperative 3<sup>rd</sup> person plural morpheme [-aw] obligatorily surfaces as [-u:]. Also, for some speakers, the 1<sup>st</sup> person singular nonperfective prefix is [ʔɑ:], instead of [ʔa].

The lexical items are generally given in broad phonetic transcription, except when providing a narrower representation is crucial for the analysis adopted in this study, as in the case of retracted [i(:)]. Also, in cases where a distinction is needed between items that are otherwise identical, a narrower transcription is presented. The broad transcription is given in cases where idiolect variation is observed. For example, [i] and [a] may surface retracted in some idiolects in items such as [kifaχ] ~ [kifaχ] ‘to hit’, therefore, a broad transcription is given for the vowels in these forms. On the other hand, when retraction of some vowels is categorical, as for /a/ in [kibər] ‘to grow big’, a narrow phonetic transcription is given for the vowel in question.

Since a narrow transcription is adopted in certain cases, vowels that do not belong to the phonemic inventory of QA are observed. These vowels are the contextual variants of some of the vowel phonemes, as given below:

-/i/ > [i], [ə]

-/a/ > [ɑ]

-/e:/ > [ɛ:]

In the same contexts, the phonetic transcriptions of the back vowels, namely [u, u:,

o:, a:], are kept intact since they do not undergo significant changes (see Hussain, 1985, p. 296). Further, for the sake of simplicity, and since this move has no bearing on the analysis adopted in this study, the feminine morpheme /-i(t)/ is represented here as [a], although this may not be phonetically accurate. It is suggested in the literature that the feminine morpheme /-i(t)/ surfaces as [ɜ] unless it is preceded by a segment that has the feature [+back], in which case it surfaces as [ɐ] (Al-Sulaiti, 1993). However, close examination of the data reveals that when the preceding segment is [-back], it is not the case that the actual realization of this morpheme is always [ɜ]. Instead, it adopts different realizations that range between [ɐ] and [ɜ] (in terms of height), depending on the preceding segment.

Forms undergoing variable lenition are followed by the symbol ◊.

Forms undergoing variable affrication are listed with both variants, starting with the variant surfacing with the velar stop.

Cases of Nominal/adjectival doublets, which could be confused with cases of affrication, as a result of including the context triggering affrication, are followed by the symbol °.

/ʔ/

. ʔablag	‘s.o. with protrusive eyes’
. balga	(f.)
. bilga:n	(pl.)
. ʔaθgal <sup>1</sup>	‘heavier’
. ʔaθgal	‘heavier’
. ʔadʒdad◊	‘newer’
. ʔadʒwidi:◊	‘kind, generous’
. ʔadʒwa:d◊	(pl.)
. ʔadʒa:wi:d◊	(pl.)
. ʔadʒr <sup>1</sup> /ʔadʒir	‘reward’
. ʔatʃa:r	‘pickles’
. ʔatʃðab	‘more lying’
. ʔatʃlah	‘gloomy’
. tʃalha	(f.)
. tʃilh	(pl.)
. ʔaragg	‘thinner, more delicate’
. ʔarkaz	‘more stable, wise’
. ʔazrag	‘blue’
. zarga	(f.)
. zirg	(pl.)
. ʔaʃgar	‘blond’

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<sup>1</sup> This variant is specific to prevocalic positions.

. ʃagra	(f.)
. ʃigir	(pl.)
. ʔaʃkara	‘as obvious’
. ʔaʃlag	‘lame’
. ʃalga	(f.)
. ʃilg	(pl.)
. ʔað <sup>ʃ</sup> jadʒ	‘tighter’
. ʔað <sup>ʃ</sup> jag	‘tighter’
. ʔaʃtadʒ	‘older’
. ʔaʃtag	‘older’
. ʔaʃdʒab	‘more strange’
. ʔaʃgaʃ <sup>ʃ</sup> l <sup>ʃ</sup>	‘wiser’
. ʔaʃmadʒ	‘darker’
. ʔaʃmag	‘darker’
. ʔaʃʃar	‘aggressive’
. gaʃra	(f.)
. giʃra:n/gaʃri:n	(pl.)
. ʔagaʃ <sup>ʃ</sup> l <sup>ʃ</sup>	‘less’
. ʔagrab	‘nearer’
. ʔagraʃ	‘bold’
. garʃa	(f.)
. girʃa:n/girraʃ	(pl.)
. ʔagwa	‘stronger’
. ʔakbar	‘bigger’
. ʔakθar	‘majority’
. ʔakθar	‘more’
. ʔakdar	‘more soiled’
. ʔakðab	‘more lying’
. ʔakram	‘more generous’
. ʔakl/ʔakil	‘food’
. ʔakla	(sg.)
. ʔaklite:n	(dual)
. ʔakla:t	(pl.)
. ʔakk-u:	‘here he is’
. ʔakk-i:	‘here she is’
. ʔaki:d	‘for sure’
. ʔanjar	‘anchor’

. ?anjarɛ:n	(dual)		
. ?na:jir	(pl.)		
. ?um haɣab	‘owl’		
. ?idʒa:r	‘rent’		
. ?idʒa:za	‘vacation’		
. ?izgirti:	‘elegant’		
. ?izgirti:ja	(f.)		
. ?izgirti:ja	(pl.)		
. ?isfindʒ	‘sponge’		
. ?imsa:k	‘constipation’		
. ?adʒdʒar	‘to rent, lease’		
. ?adʒdʒirat	. ?adʒdʒiraw	. ?adʒdʒart	. ?adʒdʒartaj
. ?adʒdʒartaw	. ?adʒdʒart	. ?adʒdʒarna	. j?adʒdʒir
. t?adʒdʒir	. j?adʒru:n	. t?adʒdʒir	. t?adʒri:n
. t?adʒru:n	. ?a?adʒdʒir	. n?adʒdʒir	. ?adʒdʒir
. ?adʒraj	. ?adʒraw	. m?adʒdʒir	. m?adʒra
. m?adʒri:n	. ta?dʒi:r	. m?adʒdʒar	. m?adʒdʒira
. m?adʒdʒari:n			
. ?adʒdʒaz	‘to be on holyday’		
. ?adʒdʒizat	. ?adʒdʒizaw	. ?adʒdʒazt	. ?adʒdʒaztaj
. ?adʒdʒaztaw	. ?adʒdʒazt	. ?adʒdʒazna	. j?adʒdʒiz
. t?adʒdʒiz	. j?adʒzu:n	. t?adʒdʒiz	. t?adʒzi:n
. t?adʒzu:n	. ?a?adʒdʒiz	. n?adʒdʒiz	. ?adʒdʒiz
. ?adʒzaj	. ?adʒzaw	. m?adʒdʒiz	. m?adʒza
. m?adʒzi:n	. ?idʒa:za	.	.
.			
. ?adʒdʒal	‘to postpone’		
. ?adʒdʒilat	. ?adʒdʒilaw	. ?adʒdʒalt	. ?adʒdʒaltaj
. ?adʒdʒaltu	. ?adʒdʒalt	. ?adʒdʒalna	. j?adʒdʒil
. t?adʒdʒil	. j?adʒdʒlu:n	. t?adʒdʒil	. t?adʒli:n
. j?adʒlu:n	. ?a?adʒdʒil	. n?adʒdʒil	. ?adʒdʒil
. ?adʒlaj	. ?adʒlaw	. m?adʒdʒil	. m?adʒla
. m?adʒli:n	. ta?dʒi:l	. m?adʒdʒal	. m?adʒdʒila
. m?adʒdʒali:n			
. ?akkad	‘to confirm’		
. ?akkidat	. ?akkidaw	. ?akkadt	. ?akkadtaj
. ?akkadtaw	. ?akkadt	. ?akkadna	. j?akkid

. tʔakkid	. jʔakdu:n	. tʔakkid	. tʔakdi:n
. tʔakdu:n	. ʔaʔakkid	. nʔakkid	. ʔakkid
. ʔakdaj	. ʔakdaw	. mʔakkid	. mʔakda
. mʔakdi:n	. taʔki:d	.	.
.			

/b/

. baðindʒa:n	‘egg plant’
. baðindʒa:na	(sg.)
. baðindʒa:nte:n	(dual)
. baðindʒa:na:t	(pl.)
. baɣil <sup>f</sup>	‘a kind of vegetables’
. bɣal <sup>f</sup> a	(sg.)
. bɣal <sup>f</sup> te:n	(dual)
. bɣal <sup>f</sup> a:t	(pl.)
. baɣl <sup>f</sup> a:wa	‘a kind of desert’
. bakista:ni:	‘from Pakistan’
. bastak	‘pistachio’
. bakra	‘female camel’
. bakrite:n	(dual)
. bakara:t	(pl.)
. bakkar/bukkar	‘pliers’
. banafsidʒi:	‘purple’
. banafsidʒi:ja	(f.)
. bandʒ	‘anesthesia’
. bandʒiri:	‘a traditional bracelet’
. bana:dʒir	(pl.)
. bawwa:g	‘thief’
. bawwa:ga	(f.)
. bawwa:gi:n	(pl.)
. ba:nka	‘fan’
. ba:nkite:n	(dual)
. ba:nka:t	(pl.)
. ba:dʒilla	‘fava beans’
. ba:tʃa	‘a traditional food’
. ba:tʃir	‘tomorrow’
. ba:dgi:r	‘a hole in the ceiling for ventilation’
. ba:sdʒi:l	‘a kind of wood’



. ba:gi:	‘remaining’
. biga:ja	(pl.)
. budʒli:	‘flash light’
. budʒlije:n	(dual)
. bidʒa:li:	(pl.)
. bu ʔagab	‘a kind of falcons’
. buʔnag	‘a traditional outfit for girls’
. buʔnage:n	(dual)
. baʔa:nig	(pl.)
. bugar	‘cow’
. bgara	(sg.)
. bgarte:n	(dual)
. bgara:t	(pl.)
. bugʃa	‘parcel’
. bugʃite:n	(dual)
. bgaʃ/bigʃ	(pl.)
. bukra	‘tomorrow’
. bunk	‘the origin of s.th.’
. bu dʃaj	‘a nick name for Khalifa’
. bu jaʃal	‘a kind of bugs’
. bitʃir	‘virgin’
. biri: <sup>2</sup>	‘tower’
. biri:je:n/birje:n	(dual)
. bra:j	(pl.)
. birtʃa	‘swimming pool’
. birtʃite:n	(dual)
. biratʃ	(pl.)
. birgaʃ	‘face cover (for women)’
. birgaʃe:n	(dual)
. bara:giʃ	(pl.)
. bigi:ja	‘the left over’
. bigʃa	‘spot’
. bigʃite:n	(dual)
. bigʃ	(pl.)

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<sup>2</sup> This form has developed as [birdʒ] > \*[birj] > [biri:]. Currently only the latter form is used, or its CA/SA cognate [burdʒ]. The quality of [i] may have changed as well, but this is irrelevant here.

. be:ðinja:n	'egg plant'		
. be:ðinja:na	(sg.)		
. be:ðinja:nte:n	(dual)		
. be:ðinja:na:t	(pl.)		
. bri:dʒ	'ewer'		
. bri:dʒe:n	(dual)		
. ʔaba:ri:dʒ	(pl.)		
. brika	'blessing'		
. bre:tʃ	'blessed'		
. biratʃ	'to sit (for animals)'		
. britʃat	. britʃaw	. biratʃt	. biratʃtaj
. biratʃtaw	. biratʃt	. biratʃna	. jibritʃ
. tibritʃ	. jibritʃu:n	. tibritʃ	. tibritʃi:n
. tibritʃu:n	. ʔabritʃ	. nibritʃ	. britʃ
. britʃaj	. britʃaw	. ba:ritʃ	. ba:rtʃa
. ba:rtʃi:n	. bartʃ	.	.
.			
. birak	'to sit (for animals)'		
. brikat	. brikaw	. birakt	. biraktaj
. biraktaw	. birakt	. birakna	. jibrik
. tibrik	. jibriku:n	. tibrik	. tibriki:n
. tibriku:n	. ʔabrik	. nibrik	. brik
. brikaj	. brikaw	. ba:rik	. ba:rka
. ba:rki:n	. bark	.	.
.			
. baħlag	'to stare'		
. baħligat	. baħligaw	. baħlagt	. baħlagtaj
. baħlagtaw	. baħlagt	. baħlagna	. jbaħlig
. tbaħlig	. jbaħligu:n	. tbaħlig	. tbaħligi:n
. tbaħligu:n	. ʔabaħlig	. nbaħlig	. baħlig
. baħligaj	. baħligaw	. mbaħlig	. mbaħliga
. mbaħligi:n	. baħliga	.	.
.			
. bagga	'to keep, detain'		
. baggat	. baggaw	. bagge:t	. bagge:taj
. bagge:taw	. bagge:t	. bagge:na	. jbaggi:
. tbaggi:	. jbaggu:n	. tbaggi:	. tbaggi:n
. tbaggu:n	. ʔabaggi:	. nbaggi:	. bagg

. baggi:	. baggaw	. mbaggi:	. mbagja
. mbaggi:n <sup>4</sup>	. tabgija	.	.
.			
. baggaʃ	‘to put in a parcel’		
. baggiʃat	. baggiʃaw	. baggaʃt	. baggaʃtaj
. baggaʃtaw	. baggaʃt	. baggaʃna	. jbaggiʃ
. tbaggiʃ	. jbagʃu:n	. tbaggiʃ	. tbagʃi:n
. tbagʃu:n	. ?abaggiʃ	. nbaggiʃ	. baggiʃ
. bagʃaj	. bagʃaw	. mbaggiʃ	. mbagʃa
. mbagʃi:n	.	. mbaggaʃ	. mbaggaʃa
.			
. bandʒah◊	‘to cry loudly’		
. bandʒihat◊	. bandʒihaw◊	. bandʒaht◊	. bandʒahtaj◊
. bandʒahtaw◊	. bandʒaht◊	. bandʒahna◊	. jbandʒih◊
. tbandʒih◊	. jbandʒihu:n◊	. tbandʒih◊	. tbandʒihi:n◊
. tbandʒihu:n◊	. ?abandʒih◊	. nbandʒih◊	. bandʒih◊
. bandʒihaj◊	. bandʒihaw◊	. mbandʒih◊	. mbandʒiha◊
. mbandʒihi:n◊	. bandʒaha◊	.	.
.			
. bangaḥ	‘to cry loudly’		
. bangihat	. bangihaw	. bangaht	. bangahtaj
. bangahtaw	. bangaht	. bangaḥna	. jbangih
. tbangih	. jbangihu:n	. tbangih	. tbangihi:n
. tbangihu:n	. ?abangih	. nbangih	. bangih
. bangihaj	. bangihaw	. mbangih	. mbangihḥa
. mbangihhi:n	. bangaḥa	.	.
.			
. bannadʒ	‘to drug’		
. bannidʒat	. bannidʒaw	. bannadʒt	. bannadʒtaj
. bannadʒtaw	. bannadʒt	. bannadʒna	. jbannidʒ
. tbannidʒ	. jbanndʒu:n	. tbannidʒ	. tbandʒi:n
. tbandʒu:n	. ?abannidʒ	. nbannidʒ	. bannidʒ
. bandʒaj	. bandʒaw	. mbannidʒ	. mbandʒa
. mbandʒi:n	. tabni:dʒ	. mbannadʒ	. mbannidʒa
. mbannadʒi:n			
. ba:g	‘to steel’		

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<sup>4</sup> Also [mbagji:n].

. ba:gat	. ba:gaw	. bigt	. bigtaj
. bigtaw	. bigt	. bigna	. jbu:g
. tbu:g	. jbu:gu:n	. tbu:g	. tbu:gi:n
. tbu:gu:n	. ?abu:g	. nbu:g	. bu:g
. bu:gaj	. bu:gaw	. ba:jig	. ba:jga
. ba:jgi:n	. bo:g	. mabju:g	. mabju:ga
. mabju:gi:n			
. ba:rak	‘to bless, congratulate’		
. ba:rikat	. ba:rikaw	. ba:rakt	. ba:raktaj
. ba:rakatw	. ba:rakt	. ba:rakna	. jba:rik
. tba:rik	. jba:rku:n	. tba:rik	. tba:rki:n
. tba:rku:n	. ?aba:rik	. nba:rik	. ba:rik
. ba:rkaj	. ba:rkaw	. mba:rik	. mba:rka
. mba:rki:n	. tabri:k	. mabru:k	. mabru:ka
. mabru:ki:n			
. biga	‘to remain’		
. bigat	. bigaw	. bige:t	. bige:taj
. bige:taw	. bige:t	. bige:na	. jibga
. tibga	. jibgo:n	. tibga	. tibge:n
. tibgo:n	. ?abga	. nibga	. bga
. bgaj	. bgaw	. ba:gi:	. ba:gja
. ba:gji:n	.	.	.
.			
/t/			
. tanak	‘tin’		
. tawki:l	‘authorization’		
. ta:d3◇	‘crown’		
. ta:d3e:n◇	(dual)		
. ti:d3a:n	(pl.)		
. ta:d3ir◇	‘wealthy, businessmen’		
. tid3d3a:r	(pl.)		
. trini:	‘citron’		
. trini:ja	(singular)		
. trini:te:n	(dual)		
. timba:k	‘tobacco’		
. tifag	‘rifle’		
. tifage:n	(dual)		

. tfa:ga	(pl.)		
. tid3a:ra	‘business’		
. tid3a:ri:	‘belonging to business, commerce’		
. tid3a:rijja	(f.)		
. tid3u:ri:	‘treasury’		
. tid3u:rije:n	(dual)		
. tara:tfi:	‘earings’		
. tirtfijja	(singular)		
. tirtfi:te:n	(dual)		
. tikfa	‘please! (m.)’		
. tikfe:n	(f.)		
. tikfo:n	(pl.)		
. ti:k	‘teak wood’		
. tard3am	‘to translate’		
. tard3imat	. tard3imaw	. tard3amt	. tard3amtaj
. tard3amtu:	. tard3amt	. tard3amna	. jtard3im
. ttard3im	. jtard3imu:n	. ttard3im	. ttard3imi:n
. tttard3imu:n	. ?atard3im	. ntard3im	. tard3im
. tard3imaj	. tard3imaw	. mtard3im	. mtard3ima
. mtard3imi:n	. tard3ama	. mtard3am	. mtard3ima
. mtard3ami:n			
. ta:d3ar	‘to work in commerce’		
. ta:d3irat	. ta:d3iraw	. ta:d3art	. ta:d3artaj
. ta:d3artaw	. ta:d3art	. ta:d3arna	. jta:d3ir
. tta:d3ir	. jta:d3ru:n	. tta:d3ir	. tta:d3ri:n
. tta:d3ru:n	. ?ata:d3ir	. nta:d3ir	. ta:d3ir
. ta:d3raj	. ta:d3raw	. mta:d3ir	. mta:d3ra
. mta:d3ri:n	. tid3a:ra	.	.
.			
. tannak	‘to be stubborn’		
. tannikat	. tannikaw	. tannakt	. tannaktaj
. tannaktaw	. tannakt	. tannakna	. jtannik
. ttannik	. jtanku:n	. ttannik	.
ttanki:n/ttanniki:n			
. ttanniko:n	. ?atannik	. ntannik	. tannik
. tannikaj	. tannikaw	. mtannik	. mtanka
. mtanki:n	. tatni:k	.	.
.			
. tirak	‘to leave’		

. trikat	. trikaw	. tirakt	. tiraktaj
. tiraktaw	. tirakt	. tirakna	. jitrik
. titrik	. jitriku:n	. titrik	. titriki:n
. titriku:n	. ?atrik	. nitrik	. trik
. tirikaj	. tirikaw	. ta:rik	. ta:rka
. ta:rki:n	. tark	. matru:k	. matru:ka
. matru:ki:n			
. tʔadʒdʒal/tiʔadʒdʒal	‘to be postponed’		
. tiʔadʒdʒilat	. tiʔadʒdʒilaw	. tiʔadʒdʒal	. tiʔadʒdʒilat
. tiʔadʒdʒilaw	. tiʔadʒdʒalt	. tiʔadʒdʒalna	. jitʔadʒdʒal
. titʔadʒdʒal	. jitʔadʒdʒilo:n	. titʔadʒdʒal	. titʔadʒdʒile:n
. titʔadʒdʒilo:n	. ?atʔadʒdʒal	. nitʔadʒdʒal	. tiʔadʒdʒal
. tiʔadʒdʒilaj	. tiʔadʒdʒilaw	. mitʔadʒdʒil	. mitʔadʒla
. mitʔadʒli:n	. taʔdʒi:l	.	.
.			
. tʔadʒdʒar/tiʔadʒdʒar	‘to be rented’		
. tiʔadʒdʒirat	. tiʔadʒdʒaraw	. tiʔadʒdʒart	. tiʔadʒdʒartaj
. tiʔadʒdʒartaw	. tiʔadʒdʒart	. tiʔadʒdʒarna	. jitʔadʒdʒar
. titʔadʒdʒar	. jitʔadʒdʒiro:n	. titʔadʒdʒar	. titʔadʒdʒire:n
. titʔadʒdʒiro:n	. ?atʔadʒdʒar	. nitʔadʒdʒar	. tiʔadʒdʒar
. tiʔadʒdʒiraj	. tiʔadʒdʒiraw	. mitʔadʒdʒir	. mitʔadʒra
. mitʔadʒri:n	. taʔdʒi:r	.	.
.			
. ttifag	‘to agree (with)’		
. ttafgat	. ttafgaw	. ttifagt	. ttifagtaj
. ttifagtaw	. ttifagt	. ttifagtna	. jittifig
. tittifig	. jittafgo:n	. tittifig	. tittifge:n
. tittafgo:n	. ?attifig	. nittifig	. ttifig
. ttafgaj	. ttafgaw	. mittifig	. mittafga
. mittafgi:n	. ttifa:g	.	.
.			
. tθalladʒ/tiθalladʒ	‘to be frozen’		
. tiθallidʒat	. tiθallidʒaw	. tiθalladʒt	. tiθalladʒtaj
. tiθalladʒtaw	. tiθalladʒt	. tiθalladʒna	. jitθalladʒ
. titθalladʒ	. jiθallidʒo:n	. titθalladʒ	. titθallidʒe:n
. titθallidʒo:n	. ?atθalladʒ	. nitθalladʒ	. tiθalladʒ
. tiθallidʒaj	. tiθallidʒaw	. mitθallidʒ	. mitθaldʒa
. mitθaldʒi:n	.	.	.

.			
. td3addam/tid3addam	‘to advance (reflexive)’		
. tid3addimat	. tid3addimaw	. tid3addamt	. tid3addamtaj
. tid3addamtaw	. tid3addamt	. tid3adamna	. jtid3addam
. ttid3addam	. jtid3addimo:n	. ttid3addam	. ttid3addime:n
. ttid3addimo:n	. ?atid3addam	. ntid3addam	. tid3addam
. tid3addimaj	. tid3addimaw	. mitd3addim	. mitd3adma
. mitd3admi:n	. tid3iddim	.	.
.			
. ttʃadda/titʃadda	‘to burp’		
. titʃaddat	. titʃadde:taw	. titʃadde:t	. titʃadde:taj
. titʃadde:taw	. titʃadde:t	. titʃadde:na	. jtitʃadda
. ttitʃadda	. jtitʃaddo:n	. ttitʃadda	. ttitʃadde:n
. ttitʃaddo:n	. ?atitʃadda	. ntitʃadda	. titʃadda
. titʃaddaj	. titʃaddaw	. mittʃaddi:	. mittʃadja
. mittʃaddi:n <sup>5</sup>	. titʃiddi:	.	.
.			
. ttʃaffas/titʃaffas	‘to be folded’		
. titʃaffisat	. titʃaffisaw	. titʃaffast	. titʃaffastaj
. titʃaffastaw	. titʃaffast	. titʃaffasna	. jtitʃaffas
. ttitʃaffas	. jtitʃaffiso:n	. ttitʃaffas	. ttitʃaffise:n
. ttitʃaffiso:n	. ?atitʃaffas	. ntitʃaffas	. titʃaffas
. titʃaffisaj	. titʃaffisaw	. mittʃaffis	. mittʃafsa
. mittʃafsi:n	. titʃiffis	.	.
.			
. thatʃtʃa/tihatʃtʃa	‘to talk’		
. thatʃtʃat	. thatʃtʃaw	. thatʃtʃe:t	. thatʃtʃe:taj
. thatʃtʃe:taw	. thatʃtʃe:t	. thatʃtʃe:na	. jihatʃtʃa
. tihatʃtʃa	. jihatʃtʃo:n	. tihatʃtʃa	. tihatʃtʃe:n
. tihatʃtʃo:n	. ?athatʃtʃa	. nihatʃtʃa	. thatʃtʃa
. thatʃtʃaj	. thatʃtʃaw	. mithatʃtʃi:	. mithatʃtʃa
. mithatʃtʃi:n <sup>6</sup>	. hatʃi:	.	.
.			
. tharrak/tiharrak	‘to move (reflexive)’		
. tharrikat	. tharrikaw	. tharrakt	. tharraktaj
. tharraktaw	. tharrakt	. tharrakna	. jitharrak

<sup>5</sup> Also [mittʃadji:n].

<sup>6</sup> [mithatʃji:n] is also possible.

. titharrak	. jitharriko:n	. titharrak	. titharrike:n
. titharriko:n	. ?atharrak	. nitharrak	. tharrak
. tharrikaj	. tharrikaw	. mitharrik	. mitharka
. mitharli:n	. tihirrik	.	.
. thangal <sup>ɿ</sup> /tihangal <sup>ɿ</sup>	‘to be tripped’		
. tihangal <sup>ɿ</sup> at	. tihangal <sup>ɿ</sup> aw	. tihangal <sup>ɿ</sup> t	. tihangal <sup>ɿ</sup> taj
. tihangal <sup>ɿ</sup> taw	. tihangal <sup>ɿ</sup> t	. tihangal <sup>ɿ</sup> na	. jtihangal <sup>ɿ</sup>
. ttihangal <sup>ɿ</sup>	. jtihangal <sup>ɿ</sup> o:n	. ttihangal <sup>ɿ</sup>	. ttihangal <sup>ɿ</sup> ε:n
. ttihangal <sup>ɿ</sup> o:n	. ?atihangal <sup>ɿ</sup>	. ntihangal <sup>ɿ</sup>	. tihangal <sup>ɿ</sup>
. tihangal <sup>ɿ</sup> aj	. tihangal <sup>ɿ</sup> aw	. mithangal <sup>ɿ</sup>	. mithangal <sup>ɿ</sup> a
. mithangal <sup>ɿ</sup> i:n	. tihingal <sup>ɿ</sup>	.	.
. tχasbag/tiχasbag	‘to be confused’		
. tχasbigat	. tχasbigaw	. tχasbagt	. tχasbagtaj
. tχasbagtaw	. tχasbagt	. tχasbagna	. jitχasbag
. titχasbag	. jitχasbiggo:n	. titχasbag	. titχasbiggo:n
. titχasbiggo:n	. ?atχasbag	. nitχasbag	. tχasbag
. tχasbigaj	. tχasbigaw	. mitχasbig	. mitχasbiga
. mitχasbigi:n	. tiχisbig		
. tðakkar/tiðakkar	‘to remember’		
. tðakkar	. tðakkiraw	. tðakkart	. tðakkartaj
. tðakkartaw	. tðakkart	. tðakkarna	. jitðakkar
. tðakkar	. jitðakkiro:n	. titðakkar	. titðakkiro:n
. titðakkiro:n	. ?atðakkar	. nitðakkar	. tðakkar
. tðakkiraj	. tðakkiraw	. mitðakkar	. mitðakra
. mitðakri:n	.	.	.
. trad3d3a/tirad3d3a	‘to beg’		
. tirad3d3at	. tirad3d3aw	. tirad3d3e:t	. tirad3d3e:taj
. tirad3d3e:taw	. tirad3d3e:t	. tirad3d3e:na	. jitrad3d3a
. titrad3d3a	. jitrad3d3o:n	. titrad3d3a	. titrad3d3e:n
. titrad3d3o:n	. atrad3d3a	. nitrad3d3a	. trad3d3a
. trad3d3aj	. trad3d3aw	. mitrad3d3i:	. mitrad3d3a
. mitrad3d3i:n <sup>7</sup>	. tirid3d3i:	.	.

<sup>7</sup> Also [mitrad3ji:n]. This is not however, a case of lenition as other geminates in the same context undergo the exact same change (see footnotes 3, 4, 5, and 6).



.			
. trajjag/tirajjag	‘to have breakfast’		
. trajjigat	. trajjigaw	. trajjagt	. trajjagtaj
. trajjagtaw	. trajjagt	. tirajjagna	. jitrajjag
. titrajjag	. jitrajjigo:n	. titrajjag	. titrajjige:n
. titrajjigo:n	. ?atrajjag	. nitrajjag	. trajjag
. trajjigaj	. trajjigaw	. mitrajjig	. mitrajga
. mitrajgi:n	.	.	.
.			
. tra:fad3/tira:fad3	‘to accompany, be friend with’		
. tira:fad3	. tira:fad3aw	. tira:fad3t	. tira:fad3taj
. tira:fad3taw	. tira:fad3t	. tira:fad3na	. jtira:fad3
. ttira:fad3	. jtira:fid3o:n	. ttira:fad3	. ttira:fid3e:n
. ttira:fid3o:n	. ?atira:fad3	. ntira:fad3	. tira:fad3
. tira:fid3aj	. tira:fid3aw	. mitra:fid3	. mitra:fd3a
. mitra:fd3i:n	.	.	.
.			
. tra:fag/tira:fag	‘to accompany’		
. tira:figat	. tira:figaw	. tira:fagt	. tira:fagtaj
. tira:fagtaw	. tira:fagt	. tira:fagna	. jtira:fag
. ttira:fag	. jtira:figo:n	. ttira:fag	. ttira:fige:n
. ttira:figo:n	. ?atira:fag	. ntira:fag	. tira:fag
. tira:figaj	. tira:figaw	. mitra:fig	. mitra:fga
. mitra:fgi:n	.	.	.
.			
. tsa:bag/tisa:bag	‘to race’		
. tisa:bigat	. tisa:bigaw	. tisa:bagt	. tisa:bagtaj
. tisa:bagtaw	. tisa:bagt	. tisa:bagna	. jtisa:bag
. ttisa:bag	. jtisa:bigo:n	. ttisa:bag	. ttisa:bige:n
. ttisa:bigo:n	. ?atisa:bag	. ntisa:bag	. tisa:bag
. tisa:bigaj	. tisa:bigaw	. mitsa:big	. mitsa:bga
. mitsa:bgi:n	.	.	.
.			
. tfaggag/tifaggag	‘to be torn repeatedly’		
. tifaggigat	. tifaggigaw	. tifaggagt	. tifaggagtaj
. tifaggagtaw	. tifaggagt	. tifaggagna	. jtifaggag

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. ttiḥaggag	. jtiḥaggigo:n	. ttiḥaggag	. ttiḥaggige:n
. ttiḥaggigo:n	. ʔatiḥaggag	. ntiḥaggag	. tiḥaggag
. tiḥaggigaj	. tiḥaggigaw	. mitḥaggig	. mitḥaggiga
. mitḥaggigi:n	. tiḥiggig	.	.
.			
. tzarkaḥ/tizarkaḥ	‘to be brocaded/decorated’		
. tzarkiḥat	. tzarkiḥaw	. tzarkaḥt	. tzarkaḥtaj
. tzarkaḥtaw	. tzarkaḥt	. tzarkaḥna	. jitzarkaḥ
. titzarkaḥ	. jitzarkiḥo:n	. titzarkaḥ	. titzarkiḥe:n
. titzarkiḥo:n	. ʔatzarkaḥ	. nitzarkaḥ	. tzarkaḥ
. tzarkiḥaj	. tzarkiḥaw	. mitzarkiḥ	. mitzarkiḥa
. mitzarkiḥi:n	. tizirkiḥ	.	.
.			
. tzawwad3/tizawwad3	‘to be married’		
. tzawwid3at	. tzawwid3aw	. tzawwad3t	. tzawwad3taj
. tzawwad3taw	. tzawwad3t	. tzawwad3na	. jitzawwad3
. titzawwad3	. jitzawwid3o:n	. titzawwad3	. titzawwid3e:n
. titzawwid3o:n	. ʔatzawwad3	. nitzawwad3	. tizawwad3
. tizawwid3aj	. tizawwid3aw	. mitzawwid3	. mitzawd3a
. mitzawd3i:n	.	.	.
.			
. tiza:lag/tiza:lag	‘to slide’		
. tiza:ligat	. tiza:ligaw	. tiza:lagt	. tiza:lagtaj
. tiza:lagtaw	. tiza:lagt	. tiza:lagna	. jtiza:lag
. ttiza:lag	. jtiza:ligo:n	. ttiza:lag	. ttiza:lige:n
. ttiza:ligo:n	. ʔatiza:lag	. ntiza:lag	. tiza:lag
. tiza:ligaj	. tiza:ligaw	. mitza:lig	. mitza:lga
. mitza:lgi:n	.	.	.
.			
. tsakkar/tisakkar	‘to close (reflexive)’		
. tsakkirat	. tsakkiraw	. tsakkart	. tsakkartaj
. tsakkartaw	. tsakkart	. tsakkarna	. jitsakkar
. titsakkar	. jitsakkiro:n	. titsakkar	. titsakkire:n
. titsakkiro:n	. ʔatsakkar	. nitsakkar	. tsakkar
. tsakkiraj	. tsakkiraw	. mitsakkir	. mitsakra
. mitsakri:n	. tisikkir	.	.
.			
. tḥaggag/tiḥaggag	‘to be flattered’		
. tiḥaggigat	. tiḥaggigaw	. tiḥaggagt	. tiḥaggagtaj

. tiʃaggagtaw	. tiʃaggagt	. tiʃaggagna	. jtiʃaggag
. ttiʃaggag	. jtiʃaggigo:n	. ttiʃaggag	. ttiʃaggige:n
. ttiʃaggigo:n	. ʔatiʃaggag	. ntiʃaggag	. tiʃaggag
. tiʃaggigaj	. tiʃaggigaw	. mitʃaggig	. mitʃaggiga
. mitʃaggigi:n	. tiʃiggig	.	.
.			
. tʃakka/tiʃakka	‘to complain (repeatedly)’		
. tiʃakkat	. tiʃakkaw	. tiʃakke:t	. tiʃakke:taj
. tiʃakke:taw	. tiʃakke:t	. tiʃakke:na	. jtiʃakka
. ttiʃakka	. jtiʃakko:n	. ttiʃakka	. ttiʃakke:n
. ttiʃakko:n	. ʔatiʃakka	. ntiʃakka	. tiʃakka
. tiʃakkaj	. tiʃakkaw	. mitʃakki:	. mitʃakja
. mitʃakji:n	. tiʃikki:	.	.
.			
. ts <sup>ʰ</sup> argaŋ/ts <sup>ʰ</sup> argaŋ	‘to be startled’		
. ts <sup>ʰ</sup> argiŋat	. ts <sup>ʰ</sup> argiŋaw	. ts <sup>ʰ</sup> argaŋt	. ts <sup>ʰ</sup> argaŋtaj
. ts <sup>ʰ</sup> argaŋtaw	. ts <sup>ʰ</sup> argaŋt	. ts <sup>ʰ</sup> argaŋna	. jts <sup>ʰ</sup> argaŋ
. tt <sup>ʰ</sup> argaŋ	. jts <sup>ʰ</sup> argiŋo:n	. tt <sup>ʰ</sup> argaŋ	. tt <sup>ʰ</sup> argiŋɛ:n
. tt <sup>ʰ</sup> argaŋo:n	. ʔat <sup>ʰ</sup> argaŋ	. nt <sup>ʰ</sup> argaŋ	. ts <sup>ʰ</sup> argaŋ
. ts <sup>ʰ</sup> argiŋaj	. ts <sup>ʰ</sup> argiŋaw	. mits <sup>ʰ</sup> argiŋ	. mits <sup>ʰ</sup> argiŋa
. mits <sup>ʰ</sup> argiŋi:n	. ts <sup>ʰ</sup> ərgiŋ	.	.
.			
. tɔ <sup>ʰ</sup> a:jag/tɔ <sup>ʰ</sup> a:jag	‘to be upset/annoyed’		
. tɔ <sup>ʰ</sup> a:jigat	. tɔ <sup>ʰ</sup> a:jigaw	. tɔ <sup>ʰ</sup> a:jagt	. tɔ <sup>ʰ</sup> a:jagtaj
. tɔ <sup>ʰ</sup> a:jagtaw	. tɔ <sup>ʰ</sup> a:jagt	. tɔ <sup>ʰ</sup> a:jagna	. jtɔ <sup>ʰ</sup> a:jag
. ttɔ <sup>ʰ</sup> a:jag	. jtɔ <sup>ʰ</sup> a:jgo:n	. ttɔ <sup>ʰ</sup> a:jag	. ttɔ <sup>ʰ</sup> a:jge:n
. ttɔ <sup>ʰ</sup> a:jgo:n	. ʔatɔ <sup>ʰ</sup> a:jag	. ntɔ <sup>ʰ</sup> a:jag	. tɔ <sup>ʰ</sup> a:jag
. tɔ <sup>ʰ</sup> a:jigaj	. tɔ <sup>ʰ</sup> a:jigaw	. mitɔ <sup>ʰ</sup> a:jig	. mitɔ <sup>ʰ</sup> a:jga
. mitɔ <sup>ʰ</sup> a:jgi:n	.	.	.
.			
. tɪadʒdʒab/tɪadʒdʒab	‘to be surprised’		
. tɪadʒdʒibat	. tɪadʒdʒibaw	. tɪadʒdʒabt	. tɪadʒdʒabtaj
. tɪadʒdʒabtaw	. tɪadʒdʒabt	. tɪadʒdʒabna	. jitɪadʒdʒab
. titɪadʒdʒab	. jitɪadʒdʒibo:n	. titɪadʒdʒab	. titɪadʒdʒibe:n
.			
. titɪadʒdʒibo:n	. ʔatɪadʒdʒab	. nitɪadʒdʒab	. tɪadʒdʒab
. tɪadʒdʒibaj	. tɪadʒdʒibaw	. mitɪadʒdʒib	. mitɪadʒba
. mitɪadʒbi:n	. tiɪidʒdʒib	.	.

.			
. tʃallag/tiʃallag	‘to be dangled’		
. tiʃalligat	. tiʃalligaw	. tiʃallagt	. tiʃallagtaj
. tiʃallagtaw	. tiʃallagt	. tiʃallagna	. jtiʃallag
. ttiʃallag	. jtiʃalligo:n	. ttiʃallag	. ttiʃallige:n
. ttiʃalligo:n	. ʔatiʃallag	. ntiʃallag	. tiʃallag
. tiʃalligaj	. tiʃalligaw	. mitʃallig	. mitʃalga
. mitʃalgi:n	. tiʃillig	.	.
.			
. tʃa:ladʒ/tiʃa:ladʒ	‘to be treated/cured’		
. tʃa:lidʒat	. tʃa:lidʒaw	. tʃa:ladʒt	. tʃa:ladʒtaj
. tʃa:ladʒtaw	. tʃa:ladʒt	. tʃa:ladʒna	. jtiʃa:ladʒ
. titʃa:ladʒ	. jitiʃa:lidʒo:n	. tiʃa:ladʒ	. titʃa:lidʒe:n
. titʃa:lidʒo:n	. ʔatiʃa:ladʒ	. ntiʃa:ladʒ	. tʃa:ladʒ
. tʃa:lidʒaj	. tʃa:lidʒaw	. mitʃa:lidʒ	. mitʃa:ldʒa
. mitʃa:ldʒi:n	.	.	.
.			
. tfarrag/tifarrag	‘to be seperated’		
. tifarrigat	. tifarrigaw	. tifarragt	. tifarragtaj
. tifarragtaw	. tifarragt	. tifarragna	. jtifarrag
. ttifarrag	. jtifarrigo:n	. ttifarrag	. ttifarrige:n
. ttifarrigo:n	. ʔatifarrag	. ntifarrag	. tifarrag
. tifarrigaj	. tifarrigaw	. mitfarrig	. mitfarga
. mitfargi:n	. tifiirrig	.	.
.			
. tgardan/tigardan	‘to be persuaded’		
. tigardinat	. tigardinaw	. tigardant	. tigardantaj
. tigardantaw	. tigardant	. tigardanna	. jtigardin
. ttigardin	. jtigardino:n	. ttigardin	. ttigardine:n
. ttigardino:n	. ʔagardin	. ngardin	. tigardan
. tigardinaj	. tigardinaw	. mitgardin	. mitgardina
. mitgardini:n	. tigirdin	.	.
.			
. tgalʳgalʳ/tigalʳgalʳ	‘to be restless’		
. tigalʳgalʳat	. tigalʳgalʳaw	. tigalʳgalʳt	. tigalʳgalʳtaj
. tigalʳgalʳtaw	. tigalʳgalʳt	. tigalʳgalʳna	. jtigalʳgalʳ
. ttigalʳgalʳ	. jtigalʳgalʳo:n	. ttigalʳgalʳ	. ttigalʳgalʳe:n
. ttigalʳgalʳo:n	. ʔatigalʳgalʳ	. ntigalʳgalʳ	. tigalʳgalʳ

. tīgāl <sup>ʕ</sup> gəl <sup>ʕ</sup> aj	. tīgāl <sup>ʕ</sup> gəl <sup>ʕ</sup> aw	. mitgāl <sup>ʕ</sup> gəl <sup>ʕ</sup>	. mitgāl <sup>ʕ</sup> gəl <sup>ʕ</sup> a
. mitgāl <sup>ʕ</sup> gəl <sup>ʕ</sup> i:n	. tīgəl <sup>ʕ</sup> gəl <sup>ʕ</sup>	.	.
.			
. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab/tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab	‘to toss about (reflexive)’		
. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbat	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abtaw	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abt	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abtaj
. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abtaw	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abt	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> abna	. jtīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab
. ttīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab	. jtīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbo:n	. ttīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab	. ttīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbe:n
. ttīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbo:n	. ?atīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab	. ntīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> ab
. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbaj	. tīgāl <sup>ʕ</sup> l <sup>ʕ</sup> əbaw	. mitgāl <sup>ʕ</sup> l <sup>ʕ</sup> əb	. mitgāl <sup>ʕ</sup> ba
. mitgāl <sup>ʕ</sup> bi:n	. tīgəl <sup>ʕ</sup> l <sup>ʕ</sup> əb	.	.
.			
. tgaddam/tigaddam	‘to advance’		
. tgaddimat	. tgaddimaw	. tgaddamt	. tgaddamtaj
. tgaddamtaw	. tgaddamt	. tgadamna	. jtigaddam
. titgaddam	. jitgaddimu:n	. titgaddam	. titgaddimi:n
. titgaddimu:n	. ?atgaddam	. nitgaddam	. tgaddam
. tgaddimaj	. tgaddimaw	. mitgaddim	. mitgadma
. mitgadmi:n	. tigiddim	.	.
.			
. tgarraḥ/tigarraḥ	‘to be cankered/sore’		
. tigarriḥat	. tigarriḥaw	. tigarraḥt	. tigarraḥtaj
. tigarraḥtaw	. tigarraḥt	. tigarraḥna	. jtigarraḥ
. ttigarraḥ	. jtigarriḥo:n	. ttigarraḥ	. ttigarriḥe:n
. ttigarraḥo:n	. ?atigarraḥ	. ntigarraḥ	. tigarraḥ
. tigarriḥaj	. tigarraḥaw	. mitgarriḥ	. mitgarḥa
. mitgarḥi:n	. tigirriḥ	.	.
.			
. tgahwa/tigahwa	‘to drink coffee’		
. tigahwat	. tigahwaw	. tigahwe:t	. tigahwe:taj
. tigahwe:taw	. tigahwe:t	. tigahwe:na	. jtigahwa
. ttigahwa	. jtigahwo:n	. ttigahwa	. ttigahwe:n
. ttigahwo:n	. ?atigahwa	. ntigahwa	. tigahwa
. tigahwaj	. tigahwaw	. mitgahwi:	. mitgahwija
. mitgahwi:n	. tigihwi:	.	.
.			
. tkabbar/tikabbar	‘to be proud’		
. tikabbirat	. tikabbartaw	. tikabbart	. tikabbartaj
. tikabbartaw	. tikabbart	. tikabbarna	. jtikabbar

. ttikabbār	. jtikabbīro:n	. ttikabbār	. ttikabbire:n
. ttikabbīro:n	. ʔatikabbār	. ntikabbār	. tikabbār
. tikabbiraj	. tikabbiraw	. mitkabbīr	. mitkabra
. mitkabri:n	. tikibbīr/takabbur	.	.
.			
. tkaddar/tikaddar	‘to be upset’		
. tikaddirat	. tikaddiraw	. tikaddart	. tikaddartaj
. tikaddartaw	. titkaddart	. tikaddarna	. jtikaddar
. ttikaddar	. jtikaddiro:n	. ttikaddar	. ttikaddire:n
. ttikaddiro:n	. ʔatikaddar	. ntikaddar	. tikaddar
. tikaddiraj	. tikaddiraw	. mitkaddīr	. mitkadra
. mitkadri:n	. tikiddīr	.	.
.			
. tkarraʕ/tikarraʕ	‘to burp’		
. tkarriʕat	. tkarriʕaw	. tikarraʕt	. tikarraʕtaj
. tikarraʕtaw	. titkarraʕt	. tikarraʕna	. jtikarraʕ
. ttikarraʕ	. jtikarriʕo:n	. ttikarraʕ	. ttikarriʕe:n
. ttikarriʕo:n	. ʔatikarraʕ	. ntikarraʕ	. tikarraʕ
. tikarriʕaj	. tikarriʕaw	. mitkarriʕ	. mitkarʕa
. mitkarʕi:n	. tikirriʕ	.	.
.			
. tkassar/tikassar	‘to be broken’		
. tikkassirat	. tikassiraw	. tikassart	. tikassartaj
. tikassartaw	. tikassart	. tikassarna	. jtikassar
. ttikassar	. jtikassiro:n	. ttikassar	. ttikassire:n
. ttikassiro:n	. ʔatikassar	. ntikassar	. tikassar
. tikassiraj	. tikassiraw	. mitkassir	. mitkasra
. mitkasri:n	. tikissir	.	.
.			
. tkassal/tikassal	‘to become lazy’		
. tikassilat	. tikassilaw	. tikassalt	. tikassaltaj
. tikassaltaw	. tikassalt	. tikassalna	. jtikassal
. ttikassal	. jtikassilo:n	. ttikassal	. ttikassile:n
. ttikassilo:n	. ʔatikassal	. ntikassal	. tikassal
. tikassilaj	. tikassilaw	. mitkassil	. mitkasla
. mitkasli:n	. tikissil	.	.
.			
. tkaffat/tikaffat	‘to picnic’		
. tkaffitat	. tkaffitaw	. tkaffatt	. tkaffattaj
. tkaffattaw	. tkaffatt	. tkaffatna	. jitkaffat

. titkaffat	. jitkaffito:n	. titkaffat	. titkaffite:n
. titkaffito:n	. ?atkaffat	. nitkaffat	. tkaffat
. tkaffitaj	. tkaffitaw	. mitkaffit	. mitkaf̣ta
. mitkaffti:n	. tikiŋfit	.	.
.			
. tkaffax/tikaffax	‘to be dressed up’		
. tkaffixat	. tkaffixaw	. tkaffaxt	. tkaffaxtaj
. tkaffaxaw	. tkaffaxt	. tkaffaxna	. jitkaffax
. titkaffax	. jitkaffixo:n	. titkaffax	. titkaffixe:n
. titkaffixo:n	. ?atkaffax	. nitkaffax	. tkaffax
. tkaffixaj	. tkaffixaw	. mitkaffix	. mitkaf̣xa
. mitkaf̣xi:n	. tikiŋfix	.	.
.			
. tkaffax/tikaffax	‘to be beaten’		
. tkaffixat	. tkaffixaw	. tkaffaxt	. tkaffaxtaj
. tkaffixaw	. tkaffaxt	. tkaffaxna	. jitkaffax
. titkaffax	. jitkaffixo:n	. titkaffax	. titkaffixe:n
. titkaffixo:n	. ?atkaffax	. nitkaffax	. tkaffax
. tkaffixaj	. tkaffixaw	. mitkaffix	. mitkaf̣xa
. mitkaf̣xi:n	. tikiŋfix	.	.
.			
. tkallam/tikallam	‘to talk’		
. tikallamat	. tikallimaw	. tikallamt	. tikallamtaj
. tikallamtaw	. tikallamt	. tikallamna	. jtikallam
. ttikallam	. jtikallimo:n	. ttikallam	. ttikallime:n
. ttikallimo:n	. ?atikallam	. ntikallam	. tikallam
. tikallimaj	. tikallimaw	. mitkallim	. mitkalma
. mitkalmi:n	. kalɔ:m	.	.
.			
. tkalwat/tikalwat	‘to be bent’		
. tikalwitat	. tikalwitaw	. tikalwatt	. tikalwattaj
. tikalwattaw	. tikalwatt	. tikalwatna	. jtikalwat
. ttikalwat	. jtikawito:n	. ttikalwat	. ttikalwite:n
. ttikalwito:n	. ?atikalwat	. ntikalwat	. tikalwat
. tikalwitaj	. tikalwitaw	. mitkalwit	. mitkalwita
. mitkalwiti:n	. tikilwit	.	.
.			
. tle:gaf/tile:gaf	‘to be nosey’		
. tile:gifat	. tile:gifaw	. tile:gaft	. tile:gaftaj
. tile:gaftaw	. tile:gaft	. tile:gafna	. jtile:gaf

. ttile:gaf	. jtile:gafo:n	. ttile:gaf	. ttile:gife:n
. ttile:gifo:n	. ?atile:gaf	. ntile:gaf	. tile:gaf
. tile:gifaj	. tile:gifaw	. mitle:gif	. mitle:gifa
. mitle:gifi:n	. tile:gif/liga:fa	.	.
.			
. tnagga/tinagga	‘to select’		
. tinaggat	. tinaggaw	. tinagge:t	. tinagge:taj
. tinagge:taw	. tinagge:t	. tinagge:taw	. jtinagga
. ttinagga	. jtinaggo:n	. ttinagga	. ttinagge:n
. ttinaggo:n	. ?atinagga	. ntinagga	. tinagga
. tinaggaj	. tinaggaw	. mitnaggi:	. mitnagja
. mitnaggi:n <sup>8</sup>	. tiniggi:	.	.
.			
. tnaggaz/tinaggaz	‘to jump repeatedly’		
. tnaggizat	. tnaggizaw	. tnaggazt	. tnaggaztaj
. tnaggaztaw	. tnaggzt	. tnaggzna	. jtinaggaz
. titnaggaz	. jtinaggizo:n	. titnaggaz	. titnaggize:n
. titnaggazo:n	. ?atnaggaz	. nitnaggaz	. tnaggaz
. tnaggizaj	. tnaggizaw	. mitnaggiz	. mitnagza
. mitnagzi:n	. tiniggiz	.	.
.			
. tnaggal <sup>ᶜ</sup> /tinaggal <sup>ᶜ</sup>	‘to move from one place to another’		
. tnaggəl <sup>ᶜ</sup> at	. tnaggəl <sup>ᶜ</sup> aw	. tnaggal <sup>ᶜ</sup> t	. tnaggal <sup>ᶜ</sup> taj
. tnaggal <sup>ᶜ</sup> taw	. tnaggal <sup>ᶜ</sup> t	. tnaggal <sup>ᶜ</sup> na	. jtinaggal <sup>ᶜ</sup>
. titnaggal <sup>ᶜ</sup>	. jtinaggəl <sup>ᶜ</sup> o:n	. titnaggal <sup>ᶜ</sup>	. titnaggəl <sup>ᶜ</sup> ε:n
. titnaggəl <sup>ᶜ</sup> o:n	. ?atnaggal <sup>ᶜ</sup>	. nitnaggal <sup>ᶜ</sup>	. tnaggal <sup>ᶜ</sup>
. tnaggəl <sup>ᶜ</sup> aj	. tnaggəl <sup>ᶜ</sup> aw	. mitnaggəl <sup>ᶜ</sup>	. mitnagl <sup>ᶜ</sup> a
. mitnagl <sup>ᶜ</sup> i:n	. tiniggəl <sup>ᶜ</sup>	.	.
.			
. tnajjas/tinajjas	‘to become impure’		
. tinajjisat	. tinajjisaw	. tinajjast	. tinajjastaj
. tinajjastu:	. tinajjast	. tinajjasna	. jtinajjas
. titnajjas	. jtinajjaso:n	. titnajjas	. titnajjise:n
. titnajjisio:n	. ?atnajjas	. nitnajjas	. tinajjas
. tinajjisaj	. tinajjisaw	. mitnajjis	. mitnajsa
. mitnajsi:n	.	.	.

<sup>8</sup> Also [mitnaggi:n].



. twad3d3aŋ/tiwad3d3aŋ	‘to have pain’		
. twad3d3iŋat	. twad3d3iŋaw	. twad3d3aŋna	. twad3d3aŋt
. twad3d3aŋtaj	. twad3d3aŋtaw	. twad3d3aŋt	. jtiwad3d3aŋ
. ttiwad3d3aŋ	. jtiwad3d3iŋo:n	. ttiwad3d3aŋ	. ttiwad3d3iŋe:n
. ttiwad3d3iŋo:n	. ʔatiwad3d3aŋ	. ntiwad3d3aŋ	. twad3d3aŋ
. twad3d3iŋaj	. twad3d3iŋaw	. mitwad3d3iŋ	. mitwad3d3a
. mitwad3d3iŋ	. tiwid3d3iŋ	.	.
. twaffad3/tiwaffad3	‘to be guided’		
. tiwaffid3at	. tiwaffid3aw	. tiwaffad3t	. tiwaffad3taj
. tiwaffad3taw	. tiwaffad3t	. tiwaffad3na	. jtiwaffad3
. ttiwaffad3	. jtiwaffid3o:n	. ttiwaffad3	. ttiwaffid3e:n
. ttiwaffid3o:n	. ʔatiwaffad3	. ntiwaffad3	. tiwaffad3
. tiwaffid3aj	. tiwaffid3aw	. mitwaffid3	. mitwafid3a
. mitwafid3i:n	.	.	.
. twaffag/tiwaffag	‘to be guided’		
. tiwaffigat	. tiwaffigaw	. tiwaffagt	. tiwaffagtaj
. tiwaffagtaw	. tiwaffagt	. tiwaffagna	. jtiwaffag
. ttiwaffag	. jtiwaffigo:n	. ttiwaffag	. ttiwaffige:n
. ttiwaffigo:n	. ʔatiwaffag	. ntiwaffag	. tiwaffag
. tiwaffigaj	. tiwaffigaw	. mitwaffig	. mitwafga
. mitwafgi:n	.	.	.
. twakkal/tiwakkal	‘to rely’		
. tiwakkilaw	. tiwakkilaw	. tiwakkalt	. tiwakkaltaj
. tiwakkaltaw	. tiwakkalt	. tiwakkalna	. jtiwakkal
. ttiwakkal	. jtiwakkilo:n	. ttiwakkal	. ttiwakkile:n
. ttiwakkilo:n	. ʔatiwakkal	. ntiwakkal	. tiwakkal
. tiwakkilaj	. tiwakkilaw	. mitwakkil	. mitwakla
. mitwakli:n	. tiwikkil	.	.
. twahhag/tiwahhag	‘to be in trouble’		
. tiwahhigat	. tiwahhigaw	. tiwahhagt	. tiwahhagtaj
. tiwahhagtaw	. tiwahhagt	. tiwahhagna	. jtiwahhag
. ttiwahhag	. jtiwahhigo:n	. ttiwahhag	. ttiwahhige:n
. ttiwahhigo:n	. ʔatiwahhag	. ntiwahhag	. tiwahhag
. tiwahhagaj	. tiwahhagaw	. mitwahhig	. mitwahga

. mitwahgi:n	. tiwihhig	.	.
.			
. tjaddad/tjaddad	‘to perform ablution’		
. tijaddidat	. tijaddidaw	. tijaddadt	. tijaddadtaj
. tijaddadtaw	. tijaddadt	. tijaddadna	. jtijaddad
. ttijaddad	. jtijaddido:n	. ttijaddad	. ttijaddide:n
. ttijaddido:n	. ?atijaddad	. ntijaddad	. tijaddad
. tijaddidaj	. tijaddidaw	. mitjaddid	. mitjaddida
. mitjaddidi:n	.	.	.
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. θidʒi:l °	‘heavy’		
. θdʒa:l	(pl.)		
. θigi:l °/θigi:l <sup>ʕ</sup>	‘heavy’		
. θga:l/θga:l <sup>ʕ</sup>	(pl.)		
. θigəl <sup>ʕ</sup>	‘weight’		
. θaldʒ	‘ice, snow’		
. θlu:dʒ	(pl.)		
. θalla:dʒa	‘fridge’		
. θalladʒ	‘to freeze’		
. θallidʒat	. θallidʒaw	. θalladʒt	. θalladʒtaj
. θalladʒtaw	. θalladʒt	. θalladʒna	. jθallidʒ
. tθallidʒ	. jθaldʒu:n	. tθallidʒ	. tθaldʒi:n
. tθaldʒu:n	. ?aθallidʒ	. nθallidʒ	. θallidʒ
. θaldʒaj	. θaldʒaw	. mθallidʒ	. mθaldʒa
. mθaldʒi:n	.	. mθalladʒ	. mθallidʒa
. mθalladʒi:n			
. θaggəl <sup>ʕ</sup>	‘to make heavy’		
. θaggəl <sup>ʕ</sup> at	. θaggəl <sup>ʕ</sup> aw	. θaggəl <sup>ʕ</sup> t	. θaggəl <sup>ʕ</sup> taj
. θaggəl <sup>ʕ</sup> taw	. θaggəl <sup>ʕ</sup> t	. θaggəl <sup>ʕ</sup> na	. jθaggəl <sup>ʕ</sup>
. tθaggəl <sup>ʕ</sup>	. jθagl <sup>ʕ</sup> u:n	. tθaggəl <sup>ʕ</sup>	. tθagl <sup>ʕ</sup> i:n
. tθagl <sup>ʕ</sup> u:n	. ?aθaggəl <sup>ʕ</sup>	. nθaggəl <sup>ʕ</sup>	. θaggəl <sup>ʕ</sup>
. θagl <sup>ʕ</sup> aj	. θagl <sup>ʕ</sup> aw	. mθaggəl <sup>ʕ</sup>	. mθagl <sup>ʕ</sup> a
. mθagl <sup>ʕ</sup> i:n	.	.	.
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/dʒ/

. dʒabir◊	‘p.n. (m.)’
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. d3abha◇	‘forehead’
. d3abhite:n◇	(dual)
. d3ba:h◇	(pl.)
. d3att	‘clover’
. d3aħaʃ◇	‘a young male donkey’
. d3aħaʃe:n◇	(dual)
. d3ħu:ʃ◇	(pl.)
. d3aχχ	‘luxury, elegant’
. d3aχχa	‘luxurious’
. d3add◇	‘grandfather’
. d3adde:n◇	(dual)
. d3du:d◇	(pl.)
. d3addu:m	‘axe’
. d3addu:me:n	(dual)
. d3ida:di:m	(pl.)
. d3arab◇	‘scabies’
. d3aras◇	‘bell’
. d3arase:n◇	(dual)
. d3ra:sa◇	(pl.)
. d3ara:d◇	‘locus’
. d3ara:da◇	(singular)
. d3ara:dte:n◇	(dual)
. d3arba:n◇	‘s.o. has scabies’
. d3arba:na◇	(f.)
. d3arba:ni:n◇	(pl.)
. d3arħ◇	‘wound’
. d3arħe:n◇	(dual)
. d3ru:ħ◇	(pl.)
. d3arra:r◇	‘drawer’
. d3ari:da	‘newspaper’
. d3ari:dte:n	(dual)
. d3ara:jid	(pl.)
. d3ari:ma	‘crime’
. d3ari:mte:n	(dual)
. d3ara:jim	(pl.)
. l-d3aza:ʔir	‘Algeria’
. l-d3asra◇	‘the name of a social/cultural club’

. dʒassu:m	‘diminutive of dʒa:sim (p.n.)’
. dʒalbu:t	‘jollyboat’
. dʒama:d	‘the first part of the name of the fifth and sixth months of the Arabic calendar’
. dʒamir◊	‘live coal, ember’
. dʒamra◊	(singular)
. dʒamrite:n◊	(dual)
. dʒamra:t◊	(pl.)
. dʒamʕa◊	‘gathering’
. dʒana:h◊	‘wing’
. dʒana:he:n◊	(dual)
. dʒinħa:n◊	(pl.)
. ʔadʒniħa	(pl.)
. dʒanna◊	‘heaven’
. dʒahil	‘ignorance’
. dʒangili:	‘one with no social manners’
. dʒangili:ja	(f.)
. dʒangal	(pl.)
. dʒamʕi:ja	‘association’
. dʒamʕi:te:n	(dual)
. dʒamʕi:ja:t	(pl.)
. dʒamma:l◊	‘camel breeder’
. dʒamma:le:n◊	(dual)
. dʒamma:li:n◊	(pl.)
. dʒawa:b	‘an answer, reply’
. dʒawa:be:n	(dual)
. ʔadʒwiba	(pl.)
. dʒawa:z	‘passport’
. dʒawa:ze:n	(dual)
. dʒawa:za:t	(pl.)
. dʒawa:hir◊	‘p.n. (f.)’
. dʒaww	‘weather’
. dʒawwa:fa	‘guava’
. dʒawwa:fte:n	. dʒawwa:fa:t
. il-dʒa:bla	‘tomorrow night’
. dʒa:r◊	‘neighbor’
. dʒa:re:n◊	(dual m.)

. dʒa:ra◊	(f.)
. dʒi:ra:n◊	(pl.)
. dʒa:rte:n◊	(dual f.)
. dʒa:ra:t◊	(pl. f.)
. il-dʒa:zi:◊	‘p.n. (f.)
. dʒa:sim	‘p.n. (m.)’
. dʒa:m	‘glass, window’
. dʒa:ma	(singular)
. dʒa:mte:n	(dual)
. dʒa:ma:t	(pl.)
. dʒa:miŋ	‘big mosque’
. dʒa:miŋe:n	(dual)
. dʒawa:miŋ	(pl.)
. dʒa:miŋi:	‘a university graduate’
. dʒa:miŋi:je:n	(dual. m.)
. dʒa:miŋi:ji:n	(pl. m.)
. dʒa:miŋi:ja	(f.)
. dʒa:miŋi:te:n	(dual. f.)
. dʒa:miŋi:ja:t	(pl. f.)
. dʒa:mfa	‘university’
. dʒa:mŋite:n	(dual)
. dʒa:mŋa:t	(pl.)
. dʒu:ti:	‘a pair of shoes’
. dʒu:ti:je:n	(dual)
. dʒuwa:ti:	(pl.)
. dʒumba:zi:	‘fraud’
. dʒumba:zi:ja	(f.)
. dʒumba:zi:ji:n	(pl.)
. dʒu:ŋ◊	‘hunger’
. dʒu:ŋa:n◊	‘hungry’
. dʒu:ŋa:na◊	(f.)
. dʒiwa:ŋa◊	(pl.)
. dʒo:hara◊	‘p.n. (f.)’
. dʒo:hara◊	‘gem’
. dʒo:harte:n◊	(dual)
. dʒawa:hir◊	(pl.)

. dʒibal◊	‘mountain’
. dʒibale:n◊	(dual)
. dʒba:l◊	(pl.)
. dʒibin/dʒubun	‘cheese’
. dʒibne:n/dʒubne:n	(dual)
. ʔadʒba:n	(pl.)
. dʒibs	‘gypsum’
. il-dʒibla	‘the direction for prayer’
. dʒihh◊	‘water melon’
. dʒihha◊	(singular)
. dʒihhite:n◊	(dual)
. dʒihha:t◊	(pl.)
. dʒidda:m◊	‘front’
. dʒidir	‘cooking pot’
. dʒidre:n	(dual)
. dʒdu:r	(pl.)
. dʒidi:d◊	‘new’
. dʒda:d◊	(pl.)
. dʒiddad◊	(pl.)
. dʒiðf◊/dʒiði:f◊	‘branch of tree’
. dʒiðfe:n◊	(dual)
. dʒðu:f◊	(pl.)
. dʒiri:f◊	‘ground wheat’
. dʒirba◊	‘leather sac (used for water/milk)’
. dʒirbite:n◊	(dual)
. dʒirab◊	(pl.)
. dʒriba◊	(pl.)
. dʒizar◊	‘carrot’
. dʒzara◊	(f.)
. dʒzarte:n◊	(dual)
. dʒzara:t◊	(pl.)
. dʒiza◊	‘reward’
. dʒizi:ra◊	‘island’
. dʒizi:rte:n◊	(dual)
. dʒizir◊	(pl.)
. dʒisir	‘bridge’
. dʒisre:n	(dual)

. dʒsu:r	(pl.)
. dʒisim	‘body’
. dʒisme:n	(dual)
. dʒsu:m	(pl.)
. dʒisma °	‘distribution’
. dʒifin◇	‘eyelid’
. dʒfu:n◇	(pl.)
. dʒifir	‘basket’
. dʒifire:n	(dual)
. dʒifra:n	(pl.)
. dʒifra◇	‘hole’
. dʒifrite:n◇	(dual)
. dʒfar◇/dʒifar◇	(pl.)
. dʒili:b	‘water well’
. dʒili:be:n	(dual)
. dʒilba:n	(pl.)
. dʒild◇	‘skin’
. dʒlu:d◇	(p.)
. dʒilf◇	‘harsh, tough’
. dʒilfe:n◇	(dual)
. dʒlu:f◇	(pl.)
. dʒimal◇	‘camel’
. dʒimale:n◇	(dual)
. dʒma:l◇	(pl.)
. dʒima:ʕa	‘folks’
. dʒimrik	‘tax, customs’
. dʒimrike:n	(dual)
. dʒama:rik	(pl.)
. dʒimʕa◇	‘Friday’
. dʒimʕite:n◇	(dual)
. dʒimaʕ◇	(pl.)
. dʒimla	‘wholesale’
. dʒinu:b◇	‘south’
. dʒinni:◇	‘genie’
. dʒinni:je:n◇	(dual m.)
. dʒina:nwa◇	(pl.)
. dʒinni:ja◇	(f.)

. dzinni:te:n◇	(dual f.)		
. dzinni:ja:t◇	(pl. f.)		
. dzihə	‘direction’		
. dzihate:n	(dual)		
. dzihə:t	(pl.)		
. dze:f	‘army’		
. dze:fe:n	(dual)		
. dzju:f	(pl.)		
. dztima:f	‘meeting’		
. dzdiri:◇	‘smallpox’		
. dzlaʕa	‘fort’		
. dzlaʕte:n	(dual)		
. dzla:f	(pl.)		
. dza◇	‘to come’		
. dzat◇	. dzaww◇	. dze:t◇	. dze:taj◇
. dze:taw◇	. dze:t◇	. dze:na◇	. jdzi:◇
. tdzi:◇	. jdzu:n◇	. tdzi:◇	. tdzi:n◇
. tdzu:n◇	. ?adzi:◇	. ndzi:◇	.
.	.	. dza:j◇	. dza:jjə◇
. dza:jjə:n◇	. dza:jjə◇	.	.
.			
. dzabbas	‘to splint (broken bones)’		
. dzabbisat	. dzabbisaw	. dzabbast	. dzabbastaj
. dzabbastaw	. dzabbast	. dzabbasna	. jdzabbis
. tdzabbis	. jdzabsu:n	. tdzabbis	. tdzabsi:n
. tdzabsu:n	. ?adzabbis	. ndzabbis	. dzabbis
. dzabsaj	. dzabsaw	. mdzabbis	. mdzabsa
. mdzabsi:n	. tadzbi:s	. mdzabbas	. mdzabbisa
. mdzabbasi:n			
. dzabbar◇	‘to splint (broken bones)’		
. dzabbirat◇	. dzabbiraw◇	. dzabbart◇	. dzabbartaj◇
. dzabbartaw◇	. dzabbart◇	. dzabbarna◇	. jdzabbir◇
. tdzabbir◇	. jdzabru:n◇	. tdzabbir◇	. tdzabri:n◇
. tdzabbiru:n◇	. ?adzabbir◇	. ndzabbir◇	. dzabbir◇
. dzabbiraj◇	. dzabbiraw◇	. mdzabbir◇	. mdzabra◇
. mdzabri:n◇	. tadzbi:r◇	. mdzabbar◇	. . mdzabbira◇
. mdzabbiri:n◇			



. d3aXX	‘to dress up’		
. d3aXXat	. d3aXXaw	. d3aXXe:t	. d3aXXe:taj
. d3aXXe:taw	. d3aXXe:t	. d3aXXe:na	. jd3iXX
. td3iXX	. jd3iXXu:n	. td3iXX	. td3iXXi:n
. td3iXXu:n	. ?ad3iXX	. nd3iXX	. d3iXX
. d3iXXaj	. d3iXXaw	. d3a:XX	. d3a:XXa
. d3a:XXi:n	. d3aXX	.	.
.			
. d3addad◇	‘to renew’		
. d3addidat◇	. d3addidaw◇	. d3addadt◇	. d3addadtaj◇
. d3addadtaw◇	. d3addadt◇	. d3addadna◇	. jd3addid◇
. td3addid◇	. jd3addidu:n◇	. td3addid◇	. td3addidi:n◇
. td3addidu:n◇	. ?ad3addid◇	. nd3addid◇	. d3addid◇
. d3addidaj◇	. d3addidaw◇	. md3addid◇	. md3addida◇
. md3addidi:n◇	. tad3di:d◇	. md3addad◇	. md3addida◇
. md3addadi:n◇			
.			
. d3addam	‘to advance (transitive)’		
. d3addimat	. d3addimaw	. d3addamt	. d3addamtaj
. d3addamtaw	. d3addamt	. d3addamna	. jd3addim
. td3addim	. jd3admu:n	. td3addim	. td3admi:n
. td3admu:n	. ?ad3addim	. nd3addim	. d3addim
. d3admaj	. d3admaw	. md3addim	. md3adma
. md3admi:n	. tad3di:m	.	.
.			
. d3addar◇	‘to have smallpox’		
. d3addirat◇	. d3addiraw◇	. d3addart◇	. d3addartaj◇
. d3addartaw◇	. d3addart◇	. d3addarna◇	. jd3addir◇
. td3addir◇	. td3adri:n◇	. td3addir◇	. td3adri:n◇
. td3adru:n◇	. ?ad3addir◇	. nd3addir◇	. d3addir◇
. d3adraj◇	. d3adraw◇	. md3addir◇	. md3adra◇
. md3adri:n◇	.	.	.
.			
. d3arr◇	‘to pull’		
. d3arrat◇	. d3arraw◇	. d3arre:t◇	. d3arre:taj◇
. d3arre:taw◇	. d3arre:t◇	. d3arre:na◇	. jd3irr◇
. td3irr◇	. jd3irru:n◇	. td3irr◇	. td3irri:n◇
. td3irru:n◇	. ?ad3irr◇	. nd3irr◇	. d3irr◇
. d3irraj◇	. d3irraw◇	. d3a:rr◇	. d3a:rra◇

. dʒɑ:ri:n◇	. dʒarr◇	.	.
.			
. dʒarrab◇	‘to try’		
. dʒarribat◇	. dʒarribaw◇	. dʒarrabt◇	. dʒarrabtaj◇
. dʒarrabtaw◇	. dʒarrabt◇	. dʒarrabna◇	. jdʒarrib◇
. tdʒarrib◇	. jdʒarbu:n◇	. tdʒarrib◇	. tdʒarbi:n◇
. tdʒarbu:n◇	. ʔadʒarrib◇	. ndʒarrib◇	. dʒarrib◇
. dʒarbaj◇	. dʒarbaw◇	. mdʒarrib◇	. mdʒarba◇
. mdʒarbi:n◇	.	. mdʒarrab◇	.
.			
. dʒassam	‘to distribute’		
. dʒassimat	. dʒassimaw	. dʒassamt	. dʒassamtaj
. dʒassamtaw	. dʒassamt	. dʒassamna	. jdʒassim
. tdʒassim	. jdʒasmu:n	. tdʒasim	. tdʒasmi:n
. tdʒasmu:n	. ʔadʒassim	. ndʒassim	. dʒassim
. dʒasmaj	. dʒasmaw	. mdʒassim	. mdʒasma
. mdʒasmi:n	. tadʒsi:m	. mdʒassam	. mdʒassima
. mdʒassami:n			
. dʒaʔʔad	‘to curl’		
. dʒaʔʔadat	. dʒaʔʔidaw	. dʒaʔʔadt	. dʒaʔʔadtaj
. dʒaʔʔadtaw	. dʒaʔʔadt	. dʒaʔʔadna	. jdʒaʔʔid
. tdʒaʔʔid	. jdʒaʔʔdu:n	. tdʒaʔʔid	. tdʒaʔʔdi:n
. tdʒaʔʔdu:n	. ʔadʒaʔʔid	. ndʒaʔʔid	. dʒaʔʔid
. dʒaʔʔdaj	. dʒaʔʔdaw	. mdʒaʔʔid	. mdʒaʔʔda
. mdʒaʔʔdi:n	. tadʒʔi:d	. mdʒaʔʔad	. mdʒaʔʔida
. mdʒaʔʔadi:n			
. dʒammaʔ◇	‘to gather’		
. dʒammiʔat◇	. dʒammiʔaw◇	. dʒammaʔt◇	. dʒammaʔtaj◇
. dʒammaʔtaw◇	. dʒammaʔt◇	. dʒammaʔna◇	. jdʒammiʔ◇
. tdʒammiʔ◇	. jdʒamʔu:n◇	. tdʒammiʔ◇	. tdʒamʔi:n◇
. tdʒamʔu:n◇	. ʔadʒammiʔ◇	. ndʒammiʔ◇	. dʒammiʔ◇
. dʒamʔaj◇	. dʒamʔaw◇	. mdʒammiʔ◇	. mdʒamʔa◇
. mdʒamʔi:n◇	.	.	.
.			
. dʒamrak	‘to cause to pay customs duties’		
. dʒamrikat	. dʒamrikaw	. dʒamrakt	. dʒamraktaj
. dʒamraktaw	. dʒamrakt	. dʒamrakna	. jdʒamrik
. tdʒamrik	. jdʒamriku:n	. tdʒamrik	. tdʒamriki:n

. tdʒamriku:n	. ʔadʒamrik	. ndʒamrik	. dʒamrik
. dʒamrikaj	. dʒamrikaw	. mdʒamrik	. mdʒamrika
. mdʒamriki:n	.	.	.
.			
. dʒawwaŋ	‘to starve (transitive)’		
. dʒawwiŋat	. dʒawwiŋaw	. dʒawwaŋt	. dʒawwaŋtaj
. dʒawwaŋtaw	. dʒawwaŋt	. dʒawwaŋna	. jdʒawwiŋ
. tdʒawwiŋ	. jdʒawŋu:n	. tdʒawwiŋ	. tdʒawŋi:n
. tdʒawŋu:n	. ʔadʒawwiŋ	. ndʒawwiŋ	. dʒawwiŋ
. dʒawŋaj	. dʒawŋaw	. mdʒawwiŋ	. mdʒawŋa
. mdʒawŋi:n	. tadʒwi:ŋ	. mdʒawwaŋ	. mdʒawwiŋa
. mdʒawwaŋi:n			
. dʒa:b	‘to bring’		
. dʒa:bat	. dʒa:baw	. dʒibt	. dʒibtaj
. dʒibtaw	. dʒibt	. dʒibna	. jdʒi:b
. tdʒi:b	. jdʒi:bu:n	. tdʒi:b	. tdʒi:bi:n
. tdʒi:bu:n	. ʔadʒi:b	. ndʒi:b	. dʒi:b
. dʒi:baj	. dʒi:baw	. dʒa:jib	. dʒa:jba
. dʒa:jbi:n	.	.	.
.			
. dʒa:bal	‘to face, take care of’		
. dʒa:bilat	. dʒa:bilaw	. dʒa:balt	. dʒa:baltaj
. dʒa:baltaw	. dʒa:balt	. dʒa:balna	. jdʒa:bil
. tdʒa:bil	. jdʒa:blu:n	. tdʒa:bil	. tdʒa:bli:n
. tdʒa:blu:n	. ʔdʒa:bil	. ndʒa:bil	. dʒa:bil
. dʒa:blaj	. dʒa:blaw	. mdʒa:bil	. mdʒa:bla
. mdʒa:bli:n	. mdʒa:bila	.	.
.			
. dʒa:d	‘to give generously’		
. dʒa:dat	. dʒa:daw	. dʒidt	. dʒidtaj
. dʒidtaw	. dʒidt	. dʒidna	. jdʒu:d
. tdʒu:d	. jdʒu:du:n	. tdʒu:d	. tdʒu:di:n
. tdʒu:du:n	. ʔadʒu:d	. ndʒu:d	. dʒu:d
. dʒu:daj	. dʒu:daw	. dʒa:jid	. dʒa:jda
. dʒa:jdi:n	. dʒu:d	.	.
.			
. dʒa:sam	‘to share with’		

. dʒɑ:samat	. dʒɑ:samaw	. dʒɑ:samt	. dʒɑ:samtaj
. dʒɑ:samtaw	. dʒɑ:samt	. dʒɑ:samna	. jdʒɑ:sim
. tdʒɑ:sim	. jdʒɑ:simu:n	. tdʒɑ:sim	. tdʒɑ:smi:n
. tdʒɑ:smu:n	. ʔadʒɑ:sim	. ndʒɑ:sim	. dʒɑ:sim
. dʒɑ:smaj	. dʒɑ:smaw	. mdʒɑ:sim	. mdʒɑ:sma
. mdʒɑ:smi:n	. mdʒɑ:sima	.	.
.			
. dʒɑ:ʃ◇	‘to be hungry’		
. dʒɑ:ʃat◇	. dʒɑ:ʃaw◇	. dʒiʃt◇	. dʒiʃtaj◇
. dʒiʃtaw◇	. dʒiʃt◇	. dʒiʃna◇	. jdʒu:ʃ◇
. tdʒu:ʃ◇	. jdʒu:ʃu:n◇	. tdʒu:ʃ◇	. tdʒu:ʃi:n◇
. tdʒu:ʃu:n◇	. ʔadʒu:ʃ◇	. ndʒu:ʃ◇	. dʒu:ʃ◇
. dʒu:ʃaj◇	. dʒu:ʃaw◇	.	.
.	. dʒu:ʃ◇	.	.
.			
. dʒɑ:had	‘to fight in a holy war’		
. dʒɑ:hidat	. dʒɑ:hidaw	. dʒɑ:hadt	. dʒɑ:hadtaj
. dʒɑ:hadtaw	. dʒɑ:hadt	. dʒɑ:hadna	. jdʒɑ:hid
. dʒɑ:hdi:n	. jdʒɑ:hdu:n	. tdʒɑ:hid	. tdʒɑ:hidi:n
. tdʒɑ:hdu:n	. ʔadʒɑ:hid	. ndʒɑ:hid	. dʒɑ:hid
. dʒɑ:hdaɟ	. dʒɑ:hdaɟ	. mdʒɑ:hid	. mdʒɑ:hda
. mdʒɑ:hdi:n	. dʒiha:d	.	.
.			
. dʒɑ:wab	‘to reply, respond to’		
. dʒɑ:wibat	. dʒɑ:wibaw	. dʒɑ:wabt	. dʒɑ:wabtaj
. dʒɑ:wabtaw	. dʒɑ:wabt	. dʒɑ:wabna	. jdʒɑ:wib
. tdʒɑ:wib	. jdʒɑ:wbu:n	. tdʒɑ:wib	. tdʒɑ:wbi:n
. tdʒɑ:wbu:n	. ʔdʒɑ:wib	. ndʒɑ:wib	. dʒɑ:wib
. dʒɑ:wbaɟ	. dʒɑ:wbaɟ	. mdʒɑ:wib	. mdʒɑ:wba
. mdʒɑ:wbi:n	. dʒawa:b	. mdʒɑ:wab (ʔale:h)	. mdʒɑ:wab
(ʔale:ha)			
. mdʒɑ:wab (ʔale:hum)			
.			
. dʒɑ:war◇	‘to sit beside, be a neighbor of’		
. dʒɑ:wirat◇	. dʒɑ:wiraw◇	. dʒɑ:wart◇	. dʒɑ:wartaj◇
. dʒɑ:wartaw◇	. dʒɑ:wart◇	. dʒɑ:warna◇	. jdʒɑ:wir◇
. tdʒɑ:wir◇	. jdʒɑ:wru:n◇	. tdʒɑ:wir◇	. tdʒɑ:wri:n◇
. tdʒɑ:wru:n◇	. ʔadʒɑ:wir◇	. ndʒɑ:wir◇	. dʒɑ:wir◇

. dʒɑ:wraj◊	. dʒɑ:wraw◊	. mdʒɑ:wir◊	. mdʒɑ:wra◊
. mdʒɑ:wri:n◊	. mdʒɑ:wira◊	.	.
.			
. dʒirah◊	‘to wound’		
. dʒirihat/dʒirhat◊	. dʒirhaw◊	. dʒiraht◊	. dʒirahtaj◊
. dʒirahtaw◊	. dʒiraht◊	. dʒirahna◊	. jidʒrah
. tidʒrah	. jidʒrihu:n	. tidʒrah	. tidʒrihi:n
. tidʒrihu:n	. ?adʒrah◊	. nidʒrah	. dʒrah◊
. dʒirhaj◊	. dʒirhaw◊	. dʒɑ:rih◊	. dʒɑ:rha◊
. dʒɑ:rihi:n◊	. dʒarh◊	. madʒru:h◊	. madʒru:ha◊
. madʒru:hi:n◊			
. dʒiza◊	‘to reward’		
. dʒizat◊	. dʒizaw◊	. dʒize:t◊	. dʒize:taj◊
. dʒize:taw◊	. dʒize:t◊	. dʒize:na◊	. jidʒzi:◊
. tidʒzi:◊	. jidʒzu:n◊	. tidʒzi:◊	. tidʒzi:n◊
. tidʒzu:n◊	. ?adʒzi:◊	. nidʒzi:◊	. dʒzi:◊
. dʒzaj◊	. dʒzaw◊	. dʒɑ:zi: ◊	. dʒɑ:zja◊
. dʒɑ:zi:n◊	. dʒiza◊	.	.
.			
. dʒibar	‘to please, satisfy’		
. dʒibirat	. dʒibiraw	. dʒibart	. dʒibartaj
. dʒibartaw	. dʒibart	. dʒibarna	. jidʒbir
. tidʒbir	. jidʒbiru:n	. tidʒbir	. tidʒbiri:n
. tidʒbiru:n	. ?adʒbir	. nidʒbir	. dʒbir
. dʒibraj	. dʒibraw	. dʒɑ:bir	. dʒɑ:bra
. dʒɑ:bri:n	. dʒabr/dʒabir	. madʒbu:r	. madʒbu:ra
. madʒbu:ri:n			
. dʒibar	‘to force’		
. dʒibirat	. dʒibiraw	. dʒibart	. dʒibartaj
. dʒibartaw	. dʒibart	. dʒibarna	. jidʒbir
. tidʒbir	. jadʒbiru:n	. tidʒbir	. tidʒbiri:n
. tidʒbiru:n	. ?adʒbir	. nidʒbir	. dʒbir
. dʒibraj	. dʒibraw	. dʒɑ:bir	. dʒɑ:bra
. dʒɑ:bri:n	. dʒabr/dʒabir	. madʒbu:r	. madʒbu:ra
. madʒbu:ri:n			
. dʒilaʃ	‘to extract’		
. dʒliʃat	. dʒliʃaw	. dʒilaʃt	. dʒilaʃtaj

. dʒilaŋtaw	. dʒilaŋt	. dʒilaŋna	. jidʒlaŋ
. tidʒlaŋ	. jidʒliŋu:n	. tidʒlaŋ	. tidʒliŋi:n
. tidʒliŋu:n	. ʔadʒlaŋ	. nidʒlaŋ	. dʒlaŋ
. dʒiliŋaj	. dʒiliŋaw	. dʒa:liŋ	. dʒa:lŋa
. dʒa:lŋi:n	. dʒalŋ	. madʒlu:ŋ	. madʒlu:ŋa
. madʒlu:ŋi:n			

/tʃ/

. tʃabb	‘shut up!’
. tʃabd	‘liver’
. tʃabda	(singular)
. tʃabdite:n	(dual)
. tʃbu:d	(pl.)
. tʃabra	‘fresh market’
. tʃabrite:n	(dual)
. tʃabra:t	(pl.)
. tʃabʃ	‘a he sheep’
. tʃba:ʃ	(pl.)
. tʃatif	‘shoulder’
. tʃatfe:n	(dual)
. tʃtu:f	(pl.)
. tʃatti:	‘prescription, receipt’
. tʃatti:je:n	(dual)
. tʃita:ti:	(pl.)
. tʃaðib	‘lies’
. tʃaðba	‘singular’
. tʃaðbite:n	(dual)
. tʃaðba:t	(pl.)
. tʃaðða:b	‘liar’
. tʃaðða:ba	(f.)
. tʃaðða:bi:n	(pl.)
. tʃarra:xi:	‘fire works’
. tʃarra:xi:ja	(singular)
. tʃarra:xi:te:n	(dual)
. tʃarra:xi:ja:t	(pl.)
. tʃafsa	‘a fold, pleat’
. tʃafsite:n	(dual)

. tʃafsa:t/tʃfisa:t	(pl.)
. tʃaff	‘a piece of jewelry that covers the hand’
. tʃaffe:n	(dual)
. tʃfu:f	(pl.)
. tʃakwi:to:	‘cheap quality’
. tʃalb	‘dog’
. tʃalbe:n	(dual)
. tʃalba	(f.)
. tʃla:b	(pl.)
. tʃam	‘how much’
. tʃanʕad	‘king mackerel fish’
. tʃanna	‘daughter in law’
. tʃannite:n	(dual)
. tʃanna:t	(pl.)
. tʃa:n	‘if, then’
. tʃa:j	‘tea’
. tʃa:jid	‘difficult, bad’
. tʃa:jda	(f.)
. tʃa:jda	(pl.)
. tʃu:la	‘stove’
. tʃu:lte:n	(dual)
. tʃwal	(pl.)
. tʃo:fa	‘seeing’
. tʃiði:	‘like that, thus’
. tʃiswa	‘clothing’
. tʃifan °	‘shroud’
. tʃifane:n °	(dual)
. tʃfa:n	(pl.)
. tʃifil	‘buttock’
. tʃifle:n	(dual)
. tʃfu:l	(pl.)
. tʃiffa	‘the plate of the scale’
. tʃiffite:n	(dual)
. tʃilla:b	‘clip, hook’
. tʃilla:be:n	(dual)
. tʃila:li:b	(pl.)
. tʃilja	‘kidney’

. tʃiljite:n	(dual)		
. tʃala:wi:	(pl.)		
. tʃim	‘sleeve’		
. tʃimme:n	(dual)		
. tʃmu:m	(pl.)		
. tʃinna	‘it is as if’		
. tʃi:ba:l	‘pillar’		
. tʃi:ba:le:n	(dual)		
. tʃija:bi:l	(pl.)		
. tʃi:t	‘a type of cotton fabric’		
. tʃi:s °	‘bag’		
. tʃi:se:n °	(dual)		
. tʃja:s	(pl.)		
. tʃi:nko:	‘sheets of zinc’		
. tʃe:f	‘how’		
. tʃe:la	‘a unit of weight’		
. tʃe:lte:n	(dual)		
. tʃjal	(pl.)		
. tʃle:b	‘dog (dimin.)’		
. tʃabtʃab	‘to silence’		
. tʃabtʃibat	. tʃabtʃibaw	. tʃabtʃabt	. tʃabtʃabtaj
. tʃabtʃabtaw	. tʃabtʃabt	. tʃabtʃabna	. jʃabtʃib
. ttʃabtʃib	. jʃabtʃibu:n	. ttʃabtʃib	. ttʃabtʃibi:n
. ttʃabtʃibu:n	. ?atʃabtʃib	. ntʃabtʃib	. tʃabtʃib
. tʃabtʃibaj	. tʃabtʃibaw	. mtʃabtʃib	. mtʃabtʃiba
. mtʃabtʃibi:n	. tʃabtʃiba	.	.
.			
. tʃattaf	‘to fold ones arms across’		
. tʃattifat	. tʃattifaw	. tʃattaft	. tʃattaftaj
. tʃattaftaw	. tʃattaft	. tʃattafna	. jʃattif
. ttʃattif	. jʃatfu:n	. ttʃatif	. ttʃatfi:n
. ttʃatfu:n	. ?atʃattif	. ntʃattif	. tʃattif
. tʃatfaj	. tʃatfaw	. mtʃattif	. mtʃatfa
. mtʃatfi:n	. tatʃti:f	.	.
.			
. tʃihat	‘to over use’		
. tʃhitat	. tʃhitatw	. tʃihat	. tʃihattaj



. tʃihattaw	. tʃihatt	. tʃihatna	. jitʃhat
. titʃhat	. jitʃhitu:n	. titʃhat	. titʃhiti:n
. titʃhitu:n	. ʔatʃhat	. nitʃhat	. tʃhat
. tʃhitaj	. tʃhitaw	. tʃɑ:hɪt	. tʃɑ:hɪta
. tʃɑ:hɪti:n	. tʃaht	.	.
.			
. tʃaððab	‘to lie’		
. tʃaððibat	. tʃaððibaw	. tʃaððabt	. tʃaððabtaj
. tʃaððabtaw	. tʃaððabt	. tʃaððabna	. jtʃaððib
. ttʃaððib	. jtʃaðbu:n	. ttʃaððib	. ttʃaðbi:n
. ttʃaðbu:n	. ʔatʃaððib	. ntʃaððib	. tʃaððib
. tʃaðbaj	. tʃaððbaw	. mtʃaððibt	. mtʃaðba
. mtʃaðbi:n	. tʃaðb/tʃaðib	.	.
.			
. tʃarray	‘to do something repeatedly’		
. tʃarriχat	. tʃarriχaw	. tʃarrayt	. tʃarraytaj
. tʃarraytaw	. tʃarrayt	. tʃarrayna	. jtʃarriχ
. ttʃarriχ	. jtʃarriχu:n	. ttʃarriχ	. ttʃarriχi:n
. ttʃarriχu:n	. ʔatʃarriχ	. ntʃarriχ	. tʃarriχ
. tʃarriχaj	. tʃarriχaw	. mtʃarriχ	. mtʃarriχa
. mtʃarriχi:n	. tatʃri:χ	. mtʃarray	. mtʃarraya
. mtʃarrayi:n			
.			
. tʃaffas	‘to fold repeatedly’		
. tʃaffisat	. tʃaffisaw	. tʃaffast	. tʃaffastaj
. tʃaffastaw	. tʃaffast	. tʃaffasna	. jtʃaffis
. ttʃaffis	. jtʃafsu:n	. ttʃaffis	. ttʃafsi:n
. ttʃafsu:n	. ʔatʃaffis	. ntʃaffis	. tʃaffis
. tʃafsaj	. tʃafsaw	. mtʃaffis	. mtʃafsa
. mtʃafsi:n	. tatʃfi:s	. mtʃaffas	. mtʃaffisa
. mtʃaffasi:n			
.			
. tʃaffan	‘to shroud’		
. tʃaffinat	. tʃaffinaw	. tʃaffant	. tʃaffantaj
. tʃaffantaw	. tʃaffant	. tʃaffanna	. jtʃaffin
. ttʃaffin	. jtʃafnu:n	. ttʃaffin	. ttʃafni:n
. ttʃafnu:n	. ʔatʃaffin	. ntʃaffin	. tʃaffin
. tʃafnaj	. tʃafnaw	. mtʃaffin	. mtʃafna
. mtʃafni:n	. tatʃfi:n	. mtʃaffan	. mtʃaffina

. mtʃaffani:n			
. tʃaŋŋam	‘to silence (transitive)’		
. tʃaŋŋimat	. tʃaŋŋimaw	. tʃaŋŋamt	. tʃaŋŋamtaj
. tʃaŋŋamtaw	. tʃaŋŋamt	. tʃaŋŋamna	. jtʃaŋŋim
. ttʃaŋŋim	. jtʃaŋŋmu:n	. ttʃaŋŋim	. ttʃaŋŋmi:n
. ttʃaŋŋmu:n	. ?atʃaŋim	. ntʃaŋŋim	. tʃaŋŋim
. tʃaŋmaj	. tʃaŋmaw	. mtʃaŋŋim	. mtʃaŋma
. mtʃaŋmi:n	. tatʃi:m	. mtʃaŋŋam	. mtʃaŋŋima
. mtʃaŋŋami:n			
. tʃandas	‘to lean’		
. tʃandisat	. tʃandisaw	. tʃandast	. tʃandastaj
. tʃandastaw	. tʃandast	. tʃandasna	. jtʃandis
. ttʃandis	. jtʃandisu:n	. ttʃandis	. ttʃandisi:n
. ttʃandisu:n	. ?atʃandis	. ntʃandis	. tʃandis
. tʃandisaj	. tʃandisaw	. mtʃandis	. mtʃandisa
. mtʃandisi:n	. tʃandisa	.	.
.			
. tʃajjas	‘to put in bags’		
. tʃajjisat	. tʃajjisaw	. tʃajjast	. tʃajjastaj
. tʃajjastaw	. tʃajjast	. tʃajjasna	. jtʃajjis
. ttʃajjis	. jtʃajjsu:n	. ttʃajjis	. ttʃajjsi:n
. ttʃajjsu:n	. ?atʃajjis	. ntʃajjis	. tʃajjis
. tʃajsaj	. tʃajsaw	. mtʃajjis	. mtʃajsa
. mtʃajsi:n	. tatʃji:s	. mtʃajjas	. mtʃajjisa
. mtʃajjasi:n			
. tʃajjal	‘to weigh’		
. tʃajjilat	. tʃajjilaw	. tʃajjalt	. tʃajjaltaj
. tʃajjaltaw	. tʃajjalt	. tʃajjalna	. jtʃajjil
. ttʃajjil	. jtʃajjlu:n	. ttʃajjil	. ttʃajjli:n
. ttʃajjlu:n	. ?atʃajjil	. ntʃajjil	. tʃajjil
. tʃajlaj	. tʃajlaw	. mtʃajjil	. mtʃajla
. mtʃajli:n	. tʃe:l	. mtʃtʃajjal	. mtʃtʃajjila
. mtʃtʃajjali:n			
. tʃa:f	‘to see’		
. tʃa:fat	. tʃa:faw	. tʃift	. tʃiftaj
. tʃiftaw	. tʃift	. tʃifna	. jtʃu:f
. ttʃu:f	. jtʃu:fu:n	. ttʃu:f	. ttʃu:fi:n

. ttʃu:fu:n	. ʔatʃu:f	. ntʃu:f	. tʃu:f
. tʃu:faj	. tʃu:faw	. tʃa:jif	. tʃa:jfa
. tʃa:jfi:n	. tʃo:f	.	.
.			
. tʃiðab	‘to lie’		
. tʃðibat	. tʃðibaw	. tʃiðabt	. tʃiðabtaj
. tʃiðabtaw	. tʃiðabt	. tʃiðabna	. jatʃðib
. tatʃðib	. jatʃðibu:n	. tatʃðib	. tatʃðibi:n
. tatʃðibu:n	. ʔatʃthib	. natʃðib	. tʃðib
. tʃðibaj	. tʃðibaw	. tʃa:ðib	. tʃa:ðba
. tʃa:ðbi:n	. tʃaðib	. matʃðu:b (ʃle:h)	. matʃðu:b (ʃle:ha)
. matʃðu:b (ʃle:hum)			
. tʃifas	‘to fold’		
. tʃfisat	. tʃfisaw	. tʃifast	. tʃifastaj
. tʃifastaw	. tʃifast	. tʃifasna	. jitʃfis
. titʃfis	. jitʃfisun	. titʃfis	. titʃfisi:n
. titʃfisun	. ʔatʃfis	. nitʃfis	. tʃfis
. tʃifsaj	. tʃifsaw	. tʃa:fis	. tʃa:fisa
. tʃa:fsi:n	. tʃafs	. matʃfu:s	. matʃfu:sa
. matʃfu:si:n			

## /h/

. ʰadʒdʒ	‘pilgrimage’
. ʰadʒdʒi:	‘pilgrim’
. ʰadʒdʒi:ja	(f.)
. ʰidʒdʒa:dʒ	(pl.)
. ʰatʃi:	‘talk’
. ʰatʃtʃa	‘itchiness’
. ʰada:g	‘fishing’
. ʰaraka	‘movement’
. ʰarakte:n	(dual)
. ʰaraka:t	(pl.)
. ʰara:dʒ	‘used goods market’
. ʰari:g/ʰari:dʒ	‘fire’
. ʰari:ga/ʰari:dʒa	(singular)
. ʰari:gte:n/ʰari:dʒte:n	(dual)
. ʰara:jig/ʰara:jidʒ	(pl.)

. ɬartɕ	‘active’
. ɬartɕa	(f.)
. ɬartɕi:n	(pl.)
. ɬarg	‘burn’
. ɬru:g	(pl.)
. ɬarg	‘grammatical mistakes’
. ɬarga	‘a grammatical mistake’
. ɬagi:ga	‘truth’
. ɬaga:jig	(pl.)
. ɬagg	‘in order to, for’
. ɬagg	‘right’
. ɬagge:n	(dual)
. ɬgu:g	(pl.)
. ɬakka	‘itchiness’
. ɬaldʒ	‘mouth’
. ɬaldʒe:n	(dual)
. ɬlu:dʒ	(pl.)
. ɬawwa:dʒ◊	‘druggist’
. ɬa:dʒa	‘need’
. ɬa:dʒib	‘eyebrow’
. ɬawa:dʒib	(pl.)
. ɬa:ridʒ	‘heart burn’
. ɬa:kim	‘ruler, president’
. ɬa:kime:n	(dual)
. ɬikka:m	(pl.)
. ɬdʒa:ra◊	‘engagement gift’
. ɬdʒa:ma◊	‘cupping’
. ɬidʒra	‘room’
. ɬidʒrite:n	(dual)
. ɬidʒar	(pl.)
. ɬidʒdʒa	‘excuse’
. ɬidʒdʒite:n	(dual)
. ɬidʒadʒ	(pl.)
. ɬintɕ	‘chin’
. ɬintɕe:n	(dual)
. ɬnu:tɕ	(pl.)
. ɬijil	‘anklet’

. ħju:l	(pl.)		
. ħijja	‘eyebrow’		
. ħijja:t	(pl.)		
. ħadʒaz/ħidʒaz	‘to book’		
. ħdʒizat	. ħdʒizaw	. ħidʒazt	. ħidʒaztaj
. ħidʒaztaw	. ħidʒazt	. ħidʒazna	. jaħdʒiz
. taħdʒiz	. jaħdʒizu:n	. taħdʒiz	. taħdʒizi:n
. taħdʒizu:n	. ?aħdʒiz	. naħdʒiz	. ħdʒiz
. ħdʒizaj	. ħdʒizaw	. ħa:dʒiz	. ħa:dʒiza
. ħa:dʒi:n	. ħadʒz/hadʒiz	. maħdʒu:z	. maħdʒu:za
. maħdʒu:zi:n			
. ħadʒdʒ	‘to go for pilgrimage’		
. ħadʒdʒat	. ħadʒdʒaw	. ħadʒdʒe:t	. ħadʒdʒe:taj
. ħadʒdʒe:taw	. ħadʒdʒe:t	. ħadʒdʒe:na	. jħidʒdʒ
. thidʒdʒ	. jħidʒdʒu:n	. thidʒdʒ	. thidʒdʒi:n
. thidʒdʒu:n	. ?aħidʒdʒ	. nħidʒdʒ	. ħidʒdʒ
. ħidʒdʒaj	. ħidʒdʒaw	. ħa:dʒdʒ	. ħa:dʒdʒa
. ħa:dʒdʒi:n	. ħadʒdʒ	.	.
.			
. ħatʃtʃ	‘to scratch’		
. ħatʃtʃat	. ħatʃtʃaw	. ħatʃtʃe:t	. ħatʃtʃe:taj
. ħatʃtʃe:taw	. ħatʃtʃe:t	. ħatʃtʃe:na	. jħitʃtʃ
. thitʃtʃ	. jħitʃtʃu:n	. thitʃtʃ	. thitʃtʃi:n
. thitʃtʃu:n	. ?aħitʃtʃ	. nħitʃtʃ	. ħitʃtʃ
. ħitʃtʃaj	. ħitʃtʃaw	. ħa:tʃtʃ	. ħa:tʃtʃa
. ħa:tʃtʃi:n	. ħatʃtʃ	.	.
.			
. ħadag	‘to fish’		
. ħdigat	. ħdigaw	. ħadagt	. ħadagtaj
. ħadagtaw	. ħadagt	. ħadagna	. jaħdig
. taħdig	. jaħdgu:n	. taħdig	. taħdigi:n
. taħdigu:n	. ?aħdig	. naħdig	. ħdig
. ħdigaj	. ħdigaw	. ħa:dig	. ħa:dga
. ħa:dgi:n	. ħada:g	.	.
.			
. ħarrak	‘to move (transitive)’		
. ħarrikat	. ħarrikaw	. ħarrakt	. ħarraktaj

. ɬarraktaw	. ɬarrakt	. ɬarrakna	. jɬarrik
. ɬarrik	. jɬarku:n	. ɬarrik	. ɬarki:n
. ɬarku:n	. ?aɬarrik	. nɬarrik	. ɬarrik
. ɬarkaj	. ɬarkaw	. mɬarrik	. mɬarka
. mɬarki:n	. taɬri:k	.	.
.			
. ɬakk	‘to scratch’		
. ɬakkat	. ɬakkaw	. ɬake:t	. ɬake:taj
. ɬake:taw	. ɬakke:t	. ɬake:na	. jɬikk
. ɬikk	. jɬikku:n	. ɬikk	. ɬikki:n
. ɬikku:n	. ?aɬikk	. nɬikk	. ɬikk
. ɬikkaj	. ɬikkaw	. ɬa:kk	. ɬa:kka
. ɬa:kki:n	. ɬakk	.	.
.			
. ɬallag	‘to shave’		
. ɬalligat	. ɬalligaw	. ɬallagt	. ɬallagtaj
. ɬallagtaw	. ɬallagt	. ɬallagna	. jɬallig
. ɬallig	. jɬalgu:n	. ɬallig	. ɬalgi:n
. ɬalgu:n	. ?aɬallig	. nɬallig	. ɬallig
. ɬalgaj	. ɬalgaw	. mɬallig	. mɬalga
. mɬalgi:n	. taɬli:g	.	.
.			
. ɬangal <sup>ɬ</sup>	‘to trip (transitive)’		
. ɬangəl <sup>ɬ</sup> at	. ɬangəl <sup>ɬ</sup> aw	. ɬangəl <sup>ɬ</sup> at	. ɬangəl <sup>ɬ</sup> taj
. ɬangəl <sup>ɬ</sup> taw	. ɬangəl <sup>ɬ</sup> t	. ɬangəl <sup>ɬ</sup> na	. jɬangəl <sup>ɬ</sup>
. ɬangəl <sup>ɬ</sup>	. jɬangəl <sup>ɬ</sup> u:n	. ɬangəl <sup>ɬ</sup>	. ɬangəl <sup>ɬ</sup> i:n
. ɬangəl <sup>ɬ</sup> u:n	. ?aɬangəl <sup>ɬ</sup>	. nɬangəl <sup>ɬ</sup>	. ɬangəl <sup>ɬ</sup>
. ɬangəl <sup>ɬ</sup> aj	. ɬangəl <sup>ɬ</sup> aw	. mɬangəl <sup>ɬ</sup>	. mɬangəl <sup>ɬ</sup> a
. mɬangəl <sup>ɬ</sup> i:n	. ɬangəl <sup>ɬ</sup> a	.	.
.			
. ɬa:tɬa	‘to talk to’		
. ɬa:tɬat	. ɬa:tɬaw	. ɬa:tɬe:t	. ɬa:tɬe:taj
. ɬa:tɬe:taw	. ɬa:tɬe:t	. ɬa:tɬe:na	. jɬa:tɬi:
. ɬa:tɬi:	. jɬa:tɬu:n	. ɬa:tɬi:	. ɬa:tɬi:n
. ɬa:tɬu:n	. ?aɬa:tɬi:	. nɬa:tɬi:	. ɬa:tɬ
. ɬa:tɬaj	. ɬa:tɬaw	. mɬa:tɬi:	. mɬa:tɬja
. mɬa:tɬ(j)i:n	.	.	.
.			

. ھا:gat <sup>ʕ</sup>	‘to surround’		
. ھا:gat <sup>ʕ</sup> at	. ھا:gat <sup>ʕ</sup> aw	. ھا:gat <sup>ʕ</sup> t	. ھا:gat <sup>ʕ</sup> taj
. ھا:gat <sup>ʕ</sup> taw	. ھا:gat <sup>ʕ</sup> t	. ھا:gat <sup>ʕ</sup> na	. jھا:gat <sup>ʕ</sup>
. ھا:gat <sup>ʕ</sup>	. jھا:gt <sup>ʕ</sup> u:n	. ھا:gat <sup>ʕ</sup>	. ھا:gt <sup>ʕ</sup> i:n
. ھا:gt <sup>ʕ</sup> u:n	. ?اھا:gat <sup>ʕ</sup>	. nھا:gat <sup>ʕ</sup>	. ھا:gat <sup>ʕ</sup>
. ھا:gt <sup>ʕ</sup> aj	. ھا:gt <sup>ʕ</sup> aw	. mھا:gat <sup>ʕ</sup>	. mھا:gt <sup>ʕ</sup> a
. mھا:gt <sup>ʕ</sup> i:n	. mھا:gt <sup>ʕ</sup> a	.	.
.			
. ھirag	‘to burn’		
. ھrigat	. ھrigaw	. ھiragt	. ھiragtaj
. ھiragtaw	. ھiragt	. ھaragna	. jahrig
. tahrig	. jihrigo:n	. tiھrig	. tiھrigi:n
. tiھrigu:n	. ?اھrig	. niھrig	. ھrig
. ھirgaj	. ھirgaw	. ھا:rig	. ھا:rga
. ھا:rgi:n	. ھarg	. mahru:g	. mahru:ga
. mahru:gi:n			
. ھikam/ھakam	‘to rule/judge’		
. ھkimat	. ھkimaw	. ھikamt	. ھikamtaj
. ھikamtaw	. ھikamt	. ھikamna	. jahkim
. tahkim	. jahkimu:n	. tahkim	. tahkimi:n
. tahkimu:n	. ?اھkim	. nahkim	. ھkim
. ھkimaj	. ھkimaw	. ھا:kim	. ھا:kma
. ھا:kmi:n	. ھikm/ھikim	. mahku:m	. mahku:ma
. mahku:mi:n			
. ھilag	‘to shave’		
. ھligat	. ھligaw	. ھilagt	. ھilagtaj
. ھilagtaw	. ھilagt	. ھilagna	. jahlig
. tahlig	. jahligu:n	. tahlig	. tahligi:n
. tahligu:n	. ?اھlig	. nahlig	. ھlig
. ھilgaj	. ھilgaw	. ھا:lig	. ھا:lga
. ھا:lgi:n	. ھila:ga	.	.
.			
. ھta:dʒ	‘to need’		
. ھta:dʒat	. ھta:dʒaw	. ھtadʒt	. ھtadʒtaj
. ھtadʒtaw	. ھtadʒt	. ھtadʒna	. jiھta:dʒ
. tiھta:dʒ	. jiھta:dʒo:n	. tiھta:dʒ	. tiھta:dʒe:n
. tiھta:dʒo:n	. ?اھta:dʒ	. niھta:dʒ	. ھta:dʒ

.hta:dʒaj	.hta:dʒaw	.mihta:dʒ	.mihta:dʒa
.mihta:dʒi:n	.htiʒa:dʒ	.	.
.			
.htirag	‘to burn (reflexive)’		
.htargat	.htargaw	.htiragt	.htiragtaj
.htiragtaw	.htiragt	.htiragna	.jihtirig
.tihtirig	.jihtargo:n	.tihtirig	.tihtarge:n
.tihtargo:n	.ʔahtirig	.nihtirig	.htirig
.htirgaj	.htirgaw	.mihtirig	.mihtarga
.mihtargi:n	.	.	.
.			
/χ/			
.χal <sup>ʕ</sup> ag	‘fabric’		
.χəl <sup>ʕ</sup> ga	(singular)		
.χəl <sup>ʕ</sup> gite:n	(dual)		
.il-χali:dʒ	‘the Gulf’		
.χali:dʒi:	‘from the Gulf’		
.χali:dʒi:je:n	(dual)		
.χali:dʒi:ji:n	(pl.)		
.χali:dʒi:ja	(f.)		
.χali:dʒi:te:n	(dual f.)		
.χali:dʒi:ja:t	(pl. f.)		
.χal <sup>ʕ</sup> g	‘people’		
.χandʒar◊	‘dagger’		
.χandʒare:n◊	(dual)		
.χandʒir◊	(pl.)		
.χanga	‘stifling’		
.χitʃri:	‘hard working but confused’		
.χitʃri:ja	(f.)		
.χitʃri:ja	(pl.)		
.χagg	‘to fail’		
.χaggat	.χaggaw	.χagge:t	.χagge:taj
.χagge:taw	.χagge:t	.χagge:na	.jχigg
.tχigg	.jχiggu:n	.tχigg	.tχiggi:n
.tχiggu:n	.ʔaχigg	.nχigg	.χigg
.χiggaj	.χiggaw	.χɑ:gg	.χɑ:gga
.χɑ:ggi:n	.χagg	.	.



. χifag	‘to mix’		
. χfigat	. χfigaw	. χifagt	. χifagtaj
. χifagtaw	. χifagt	. χifagna	. jaχfig
. taχfig	. jaχfigu:n	. taχfig	. taχfigi:n
. taχfigu:n	. ?aχfig	. naχfig	. χfig
. χifgaj	. χifgaw	. χa:fig	. χa:fga
. χa:figi:n	. χafg	. maχfu:g	. maχfu:ga
. maχfu:gi:n			
. χəl <sup>ʰ</sup> ag	‘to create’		
. χl <sup>ʰ</sup> əgat	. χl <sup>ʰ</sup> əgaw	. χəl <sup>ʰ</sup> agt	. χəl <sup>ʰ</sup> agtaj
. χəl <sup>ʰ</sup> agtaw	. χəl <sup>ʰ</sup> agt	. χəl <sup>ʰ</sup> agna	. jaχl <sup>ʰ</sup> əg
. taχl <sup>ʰ</sup> əg	. jaχl <sup>ʰ</sup> əgu:n	. taχl <sup>ʰ</sup> əg	. taχl <sup>ʰ</sup> əgi:n
. taχl <sup>ʰ</sup> əgu:n	. ?aχl <sup>ʰ</sup> əg	. naχl <sup>ʰ</sup> əg	. χl <sup>ʰ</sup> əg
. χl <sup>ʰ</sup> əgaj	. χl <sup>ʰ</sup> əgaw	. χa:l <sup>ʰ</sup> əg	. χa:l <sup>ʰ</sup> ga
. χa:l <sup>ʰ</sup> gi:n	. χal <sup>ʰ</sup> g	. maχl <sup>ʰ</sup> u:g	. maχl <sup>ʰ</sup> u:ga
. maχl <sup>ʰ</sup> u:gi:n			
. χinag	‘to strangle/safocate (transitive)’		
. χnigat	. χnigaw	. χinagt	. χinagtaj
. χinagtaw	. χinagt	. χinagna	. jaχnig
. taχnig	. jaχnigu:n	. taχnig	. taχnigi:n
. taχnigu:n	. ?aχing	. naχnig	. χnig
. χingaj	. χingaw	. χa:nig	. χa:nga
. χa:nigi:n	. χang	. maχnu:g	. maχnu:ga
. maχnu:gi:n			
. χtinag	‘to safocate’		
. χtangat	. χtangaw	. χtinagt	. χtinagtaj
. χtinagtaw	. χtinagt	. χtinagna	. jiχtinig
. tiχtinig	. jiχtango:n	. tiχtinig	. tiχtange:n
. tiχtango:n	. ?aχtinig	. niχtinig	. χtinig
. χtingaj	. χtingaw	. miχtinig	. miχtanga
. miχtangi:n	.	.	.
.			
/d/			
. id-dad3d3a:l	‘the Anti-Christ’		
. daraj	‘stairs’		
. draja	(singular)		

. drajte:n	(dual)
. draja:t	(pl.)
. dagl <sup>1</sup> a	‘long, open coat’
. dagl <sup>1</sup> əte:n	(dual)
. dagl <sup>1</sup> ɑ:t	(pl.)
. dantʃal	‘sandal wood’
. da:gg	‘idiot’
. da:gga	(f.)
. da:ggi:n	(pl.)
. didʒi:dʒ	‘fishing net’
. ʔadigga	(pl.)
. digi:g/didʒi:dʒ	‘thin, small (m.)’
. digi:ga/didʒi:dʒa	(f.)
. dga:g	(pl.)
. digi:ga	‘minute’
. digi:gte:n	(dual)
. diga:jig	(pl.)
. digma	‘shorty’
. dgam	(pl.)
. dikka:n	‘shop’
. dikka:ne:n	(dual)
. dika:ki:n	(pl.)
. dija:j	‘chicken’
. dija:ja	(singular)
. dija:jte:n	(dual)
. dija:ja:t	(pl.)
. di:tʃ °	‘cock’
. di:tʃe:n °	(dual)
. dju:tʃ/dja:tʃa	(pl.)
. di:k °	‘cock’
. di:ke:n °	(dual)
. dju:k	(pl.)
. do:ʃag	‘mattress’
. do:ʃage:n	(dual)
. diwa:ʃig	(pl.)
. dre:j	‘stairs (dim.)’
. dke:ki:n	‘shop (dim.)’

. dke:ki:ne:n	(dual)		
. dke:ki:nɑ:t	(pl.)		
. dagdag	‘to stroke repeatedly’		
. dagdigat	. dagdigaw	. dagdagt	. dagdagtaj
. dagdagtaw	. dagdagt	. dagdagna	. jdagdig
. tdagdig	. jdagdigu:n	. tdagdig	. tdagdigi:n
. tdagdigu:n	. ?adagdig	. ndagdig	. dagdig
. dagdigaj	. dagdigaw	. mdagdig	. mdagdiga
. mdagdigi:n	. dagdiga	.	.
.			
. daggag	‘to make small, thin’		
. daggigat	. daggigaw	. daggagt	. daggagtaj
. daggagtaw	. daggagt	. daggagna	. jdaggig
. tdaggig	. jdaggigu:n	. tdaggig	. tdaggigi:n
. tdaggigu:n	. ?adaggig	. ndaggig	. daggig
. daggigaj	. daggigaw	. mdaggig	. mdaggiga
. mdaggigi:n	. tadgi:g	.	.
.			
. dagg	‘to knock, stroke’		
. daggat	. daggaw	. dagge:t	. dagge:taj
. dagge:taw	. dagge:t	. dagge:na	. jdigg
. tdigg	. jdiggu:n	. tdigg	. tdiggigi:n
. tdiggu:n	. ?adigg	. ndigg	. digg
. diggaj	. diggaw	. da:gg	. da:gga
. da:ggi:n	. dagg	. madgu:g	. madgu:ga
. madgu:gi:n			
.			
. dawwag	‘to calm down’		
. dawwigat	. dawwagtaw	. dawwagt	. dawwagtaj
. dawwagtaw	. dawwagt	. dawwagna	. jdawwig
. tdawwig	. jdawgu:n	. tdawwig	. tdawgi:n
. tdawgu:n	. ?adawwig	. ndawwig	. dawwig
. dawgaj	. dawgaw	. mdawwig	. mdawga
. mdawgi:n	.	.	.
.			
. da:batʃ	‘to walk rapidly’		
. da:bitʃat	. da:bitʃaw	. da:batʃt	. da:batʃtaj
. da:batʃtaw	. da:batʃt	. da:batʃna	. jda:bitʃ
. tda:bitʃ	. jda:btʃu:n	. tda:bitʃ	. tda:btʃi:n

. tda:btʃu:n	. ʔada:bitʃ	. nda:bitʃ	. da:bitʃ
. da:btʃaj	. da:btʃaw	. mda:bitʃ	. mda:btʃa
. mda:btʃi:n	. mda:bitʃa	.	.
.			
/ð/			
. ðaka	‘smartness’		
. ðaki:	‘smart, clever’		
. ðaki:ja	(f.)		
. ʔaðki:ja	(pl.)		
. ða:k	‘that’		
. ði:k/ði:tʃ	(f.)		
. ðe:la:k	(pl.)		
. ðo:g	‘taste’		
. ðikar	‘male’		
. ðikare:n	(dual)		
. ðka:ra/ðku:r	(pl.)		
. ðikir	‘a religious ritual’		
. ði l-hidʒdʒa	‘the last month of the Arabic calendar’		
. ðakkar	‘to remind’		
. ðakkirat	. ðakkiraw	. ðakkart	. ðakkartaj
. ðakkartaw	. ðakkart	. ðakkarna	. jðakkir
. tðakkir	. jðakru:n	. tðakkir	. tðakri:n
. tðakru:n	. ʔaðakkir	. nðakkir	. ðakkir
. ðakraj	. ðakraw	. mðakkir	. mðakra
. mðakri:n	. taðki:r	.	.
.			
. ða:g	‘to taste’		
. ða:gat	. ða:gaw	. ðigt	. ðigtaj
. ðigtaw	. ðigt	. ðigna	. jðu:g
. tðu:g	. jðu:gu:n	. tðu:g	. tðu:gi:n
. tðu:gu:n	. ʔaðu:g	. nðu:g	. ðu:g
. ðu:gaj	. ðu:gaw	. ða:jig	. ða:jga
. ða:jgi:n	. ðo:g	.	.
.			
. ðikar	‘to recall’		
. ðkirat	. ðkiraw	. ðikart	. ðikartaj
. ðikartaw	. ðikart	. ðikarna	. jiðkir

. tiðkir	. jiðkiru:n	. tiðkir	. tiðkiri:n
. tiðkiru:n	. ʔaðkir	. niðkir	. ðkir
. ðkiraj/ðikraj	. ðkiraw/ðikraw	. ða:kir	. ða:kra
. ða:kri:n	. ðikr/ðikir	.	.
.			

/r/

. radʒab	‘the sixth month of the Arabic calendar’
. radʒa	‘hope’
. radʒʕa	‘return’
. rakð <sup>ʕ</sup> a	‘a run’
. rajja:l	‘man’
. rajja:le:n	(dual)
. rija:ji:l	(pl.)
. ra:zdʒi:	‘a type of traditional perfume’
. ra:kib	‘passenger’
. ra:kbe:n	(dual)
. ra:kba	(f.)
. ra:kbite:n	(dual f.)
. rikka:b	(pl.)
. rizg	‘means of living’
. rizge:n	(dual)
. ʔarza:g	(pl.)
. rifi:dʒ	‘friend’
. rifi:dʒe:n	(dual)
. rifu:dʒa:n	(pl.)
. rifi:dʒa	(f.)
. rifu:dʒa:t/rifi:dʒa:t	(pl. f.)
. rigi:g/ridʒi:dʒ	‘transparent, delicate (m.)’
. rigi:ga/ridʒi:dʒa	‘(f.)’
. rga:g	(pl.)
. rigʕa	‘surface’
. rikba	‘knee’
. rikbite:n	(dual)
. rkab	(pl.)
. ri:l	‘leg’
. ri:le:n	(dual)
. rju:l	(pl.)

. ri:g/ri:dʒ	‘saliva’		
. rɢɑ:g	‘a kind of bread’		
. rju:g	‘breakfast’		
. radʒdʒaɪ	‘to return (transitive)’		
. radʒdʒiɪfət	. radʒdʒiɪfaw	. radʒdʒaɪt	. radʒdʒaɪtəj
. radʒdʒaɪtaw	. radʒdʒaɪt	. radʒdʒaɪna	. jradʒdʒiɪf
. tradʒdʒiɪf	. jradʒdʒiɪu:n	. tradʒdʒiɪf	. tradʒdʒiɪ:n
. tradʒdʒiɪu:n	. ʔaradʒdʒiɪf	. nradʒdʒiɪf	. radʒdʒiɪf
. radʒɪaj	. radʒɪaw	. mradʒdʒiɪf	. mradʒɪa
. mradʒiɪ:n	. tardʒiɪf	.	.
.			
. ragg	‘to become thin, delicate’		
. raggat	. raggaw	. ragge:t	. ragge:təj
. ragge:taw	. ragge:t	. ragge:na	. jrigg
. trigg	. jriggu:n	. trigg	. triggɪ:n
. triggɪu:n	. ʔarigg	. nrigg	. rigg
. riggaj	. riggaw	. ra:gg	. ra:ggə
. ra:ggi:n	. rigga	.	.
.			
. raggag	‘to make thin’		
. raggigat	. raggigaw	. raggagt	. raggagtəj
. raggagtaw	. raggagt	. raggagna	. jraggig
. traggig	. jraggigu:n	. traggig	. traggigɪ:n
. traggigu:n	. ʔraggig	. nraggig	. raggig
. raggigaj	. raggigaw	. mraggig	. mraggiga
. mraggigɪ:n	. targi:g	.	.
.			
. rakkab	‘to assemble’		
. rakkibat	. rakkibaw	. rakkabt	. rakkabtəj
. rakkabtaw	. rakkabt	. rakkabna	. jrakkib
. trakkib	. jrakbu:n	. trakkib	. trakbi:n
. trakbu:n	. ʔarakkib	. nrakkib	. rakkib
. rakbaj	. rakbaw	. mrakkib	. mrakba
. mrakbi:n	. tarki:b	. mrakkab	. mrakkiba
. mrakkabi:n			
.			
. rajjag	‘to feed (breakfast)’		
. rajjigat	. rajjigaw	. rajjagt	. rajjagtəj
. rajjagtaw	. rajjagt	. rajjagna	. jrajjig
. trajjig	. jrajgi:n	. trajjig	. trajgi:n

. trajjgu:n	. ?arajjig	. nrajjig	. rajjig
. rajgaj	. rajgaw	. mrajjig	. mrajga
. mrajgi:n	.	.	.
.			
. ra:dʒaŋ	‘to review’		
. ra:dʒiŋat	. ra:dʒiŋaw	. ra:dʒaŋt	. ra:dʒaŋtaj
. ra:dʒaŋtaw	. ra:dʒaŋt	. ra:dʒaŋna	. jra:dʒiŋ
. tra:dʒiŋ	. jra:dʒiŋu:n	. tra:dʒiŋ	. tra:dʒiŋi:n
. tra:dʒiŋu:n	. ?ara:dʒiŋ	. nra:dʒiŋ	. ra:dʒiŋ
. ra:dʒiŋaj	. ra:dʒiŋaw	. mra:dʒiŋ	. mra:dʒiŋa
. mra:dʒiŋi:n	. mra:dʒiŋa	.	.
.			
. ra:faɖʒ	‘to accompany, befriend with’		
. ra:fiɖʒat	. ra:fiɖʒaw	. ra:faɖʒt	. ra:faɖʒtaj
. ra:faɖʒtaw	. ra:faɖʒt	. ra:faɖʒna	. jra:fiɖʒ
. tra:fiɖʒ	. jra:fiɖʒu:n	. tra:fiɖʒ	. tra:fiɖʒi:n
. tra:fiɖʒu:n	. ?ara:fiɖʒ	. nra:fiɖʒ	. ra:fiɖʒ
. ra:faɖʒaj	. ra:faɖʒaw	. mra:fiɖʒ	. mra:faɖʒa
. mra:fiɖʒi:n	. mra:fiɖʒa	.	.
.			
. ra:fag	‘to accompany, befriend with’		
. ra:figat	. ra:figaw	. ra:fagt	. ra:fagtaj
. ra:fagtaw	. ra:fagt	. ra:fagna	. jra:fig
. tra:fig	. jra:figu:n	. tra:fig	. tra:figi:n
. tra:figu:n	. ?ara:fig	. nra:fig	. ra:fig
. ra:fgaj	. ra:fgaw	. mra:fig	. mra:fga
. mra:figi:n	. mrafiga	.	.
.			
. ra:kað̚ʰ	‘to race’		
. ra:kað̚ʰat	. ra:kað̚ʰaw	. ra:kað̚ʰt	. ra:kað̚ʰtaj
. ra:kað̚ʰtaw	. ra:kað̚ʰt	. ra:kað̚ʰna	. jra:kað̚ʰ
. tra:kað̚ʰ	. jra:kað̚ʰu:n	. tra:kað̚ʰ	. tra:kað̚ʰi:n
. tra:kað̚ʰu:n	. ?ara:kað̚ʰ	. nra:kað̚ʰ	. ra:kað̚ʰ
. ra:kað̚ʰaj	. ra:kað̚ʰaw	. mra:kað̚ʰ	. mra:kað̚ʰa
. mra:kað̚ʰi:n	. mra:kað̚ʰa	.	.
.			
. riɖʒaŋ	‘to return’		
. riɖʒiŋat	. riɖʒiŋaw	. riɖʒaŋt	. riɖʒaŋtaj

. ridʒaɪtaw	. ridʒaɪt	. ridʒaɪna	. jirdʒaɪ
. tirdʒaɪ	. jirdʒiɪu:n	. tirdʒaɪ	. tirdʒiɪi:n
. tirdʒiɪu:n	. ʔardʒaɪ	. nirdʒaɪ	. rdʒaɪ
. rdʒiɪaj/ridʒiɪaj	. rdʒiɪaw/ridʒiɪaw	. ra:dʒiɪ	. ra:dʒiɪa
. ra:dʒiɪi:n	. ridʒu:ɪ	.	.
.			
. rizag	‘to bless with, provide’		
. rzigat	. rzigaw	. rizagt	. rizagtaj
. rizagtaw	. rizagt	. rizagna	. jirzig
. tirzig	. jirzigu:n	. tirzig	. tirzigi:n
. tirzigu:n	. ʔarzig	. nirzig	. rzig
. rzigaj	. rzigaw	. ra:zig	. ra:zga
. ra:zgi:n	. rizg/rizig	. marzu:g	. marzu:ga
. marzu:gi:n			
. rigas <sup>ɪ</sup>	‘to dance’		
. rgəs <sup>ɪ</sup> at	. rgəs <sup>ɪ</sup> aw	. rigas <sup>ɪ</sup> t	. rigs <sup>ɪ</sup> taj
. rigas <sup>ɪ</sup> taw	. rigas <sup>ɪ</sup> t	. rigas <sup>ɪ</sup> na	. jirgəs <sup>ɪ</sup>
. tirgəs <sup>ɪ</sup>	. jirgəs <sup>ɪ</sup> u:n	. tirgəs <sup>ɪ</sup>	. tirgəs <sup>ɪ</sup> i:n
. tirgəs <sup>ɪ</sup> u:n	. ʔargəs <sup>ɪ</sup>	. nargəs <sup>ɪ</sup>	. rgəs <sup>ɪ</sup>
. rigs <sup>ɪ</sup> aj	. rigs <sup>ɪ</sup> aw	. ra:gəs <sup>ɪ</sup>	. ra:gs <sup>ɪ</sup> a
. ra:gs <sup>ɪ</sup> i:n	. rags <sup>ɪ</sup> /ragəs <sup>ɪ</sup>	.	.
.			
. rikab	‘to ride/ascend’		
. rikbat	. rkibaw	. rikabt	. rikabtaj
. rikabtaw	. rikabt	. rikabna	. jirkab
. tirkab	. jirkibu:n	. tirkab	. tirkibe:n
. tirkibu:n	. ʔarkab	. nirkab	. rkab
. rikibaj	. rikibaw	. ra:kib	. ra:kba
. ra:kbi:n	. rku:b	.	.
.			
. rikad	‘to calm down’		
. rkidat	. rkidaw	. rikadt	. rikadtaj
. rikadtaw	. rikadt	. rikadna	. jirkid
. tirkid	. jirkidu:n	. tirkid	. tirkidi:n
. tirkidu:n	. ʔarkid	. nirkid	. rkid
. rkidaj	. rkidaw	. ra:kid	. ra:kda
. ra:kdi:n	. rku:d	.	.
.			
. rikaz	‘to be stable, wise’		



. rkizat	. rkizaw	. rikazt	. rikaztaj
. rikaztaw	. rikazt	. rikazna	. jirkaz
. tirkaz	. jirkizu:n	. tirkaz	. tirkizi:n
. tirkizu:n	. ʔarkaz	. nirkaz	. rkaz
. rkizaj	. rkizaw	. ra:kiz	. ra:kza
. ra:kzi:n	.	.	.
.			
. rikað <sup>ʕ</sup>	‘to run’		
. rkəð <sup>ʕ</sup> at	. rkəð <sup>ʕ</sup> aw	. rikað <sup>ʕ</sup> t	. rikað <sup>ʕ</sup> taj
. rikað <sup>ʕ</sup> taw	. rikað <sup>ʕ</sup> t	. rikað <sup>ʕ</sup> na	. jirkəð <sup>ʕ</sup>
. tirkəð <sup>ʕ</sup>	. jirkəð <sup>ʕ</sup> u:n	. tirkəð <sup>ʕ</sup>	. tirkəð <sup>ʕ</sup> i:n
. tirkəð <sup>ʕ</sup> u:n	. ʔarkəð <sup>ʕ</sup>	. nirkəð <sup>ʕ</sup>	. rkəð <sup>ʕ</sup>
. rikð <sup>ʕ</sup> aj	. rikð <sup>ʕ</sup> aw	. ra:kəð <sup>ʕ</sup>	. ra:kð <sup>ʕ</sup> a
. ra:kð <sup>ʕ</sup> i:n	. rakð <sup>ʕ</sup> /rakəð <sup>ʕ</sup>	.	.
.			

/z/

. zarkifa	‘brocade’
. zaka:(t)	‘charity (the third pillar of Islam)’
. zalag	‘slippery’
. zalga	‘a slip’
. zalgite:n	(dual)
. zalga:t	(pl.)
. zagg	‘stool’
. zagga	(singular)
. zandʒibi:l	‘ginger’
. zawa:dʒ	‘marriage’
. zo:dʒ	‘a couple’
. zo:dʒ	‘husband’
. zo:dʒe:n	(dual)
. zo:dʒa	‘wife’
. zo:dʒte:n	(dual)
. zo:dʒa:t	(pl.)
. zo:dʒe:n	‘hasband and wife’
. zindʒafra	‘sweater’
. zindʒifa	‘playing cards’
. zi:dʒ	‘edging, cord’
. zagg	‘to defecate (slang)’

. zaggat	. zaggaw	. zagge:t	. zagge:taj
. zagge:taw	. zagge:t	. zagge:na	. jzigg
. tzig	. jziggu:n	. tzig	. tziggi:n
. tziggu:n	. ʔazigg	. nzigg	. zigg
. ziggaj	. ziggaw	. za:gg	. za:gga
. za:ggi:n	. zagg	.	.
.			
. zarkaʃ	‘to decorate’		
. zarkifət	. zarkifaw	. zarkaʃt	. zarkaʃtaj
. zarkaʃtaw	. zarkaʃt	. zarkaʃna	. jzarkif
. tzarkif	. jzarkifʉ:n	. tzarkif	. tzarkifʉ:n
. tzarkifʉ:n	. ʔazarkif	. nzarkif	. zarkif
. zarkifaj	. zarkifaw	. mzarkif	. mzarkifa
. mzarkifʉ:n	. zarkifa	. mzarkaʃ	. mzarkifa
. mzarkaʃʉ:n			
.			
. zawwadʒ	‘to marry off’		
. zawwidʒat	. zawwidʒaw	. zawwadʒt	. zawwadʒtaj
. zawwadʒtaw	. zawwadʒt	. zawwadʒna	. jzawwidʒ
. tzawwidʒ	. jzawdʒʉ:n	. tzawwidʒ	. tzawdʒʉ:n
. tzawdʒʉ:n	. ʔazawwidʒ	. nzawwidʒ	. zawwidʒ
. zawdʒaj	. zawdʒaw	. mzawwidʒ	. mzawdʒa
. mzawdʒʉ:n	. tazwi:dʒ	.	.
.			
. za:ʃag	‘to yell’		
. za:ʃigat	. za:ʃigaw	. za:ʃagt	. za:ʃagtaj
. za:ʃigtaw	. za:ʃagt	. za:ʃagna	. jza:ʃig
. tza:ʃig	. jza:ʃgu:n	. tza:ʃig	. tza:ʃgi:n
. tza:ʃgi:n	. ʔaza:ʃig	. nza:ʃig	. za:ʃig
. za:ʃgaj	. za:ʃgaw	. mza:ʃig	. mza:ʃga
. mza:ʃgi:n	. zʃa:g	.	.
.			
. zifadʒ	‘to bother/disturb’		
. zʃidʒat	. zʃidʒaw	. zifadʒt	. zifadʒtaj
. zifadʒtaw	. zifadʒt	. zifadʒna	. jizʃidʒ
. tizʃidʒ	. jizʃidʒʉ:n	. tizʃidʒ	. tizʃidʒʉ:n
. tizʃidʒʉ:n	. ʔazʃidʒ	. nizʃidʒ	. zʃidʒ
. zʃidʒaj	. zʃidʒaw	. mizʃidʒ	. mizʃidʒa

. mizʕidʒi:n	. zʕa:dʒ	.	.
.			
. zigar	‘to scold’		
. zgirat	. zgiraw	. zigar	. zigartaj
. zigartaw	. zigart	. zigarna	. jizgir
. tizgir	. jizgiru:n	. tizgir	. tizgiri:n
. tizgiru:n	. ʔazgir	. nizgir	. zgir
. zgiraj	. zgiraw	. za:gir	. za:gra
. za:gri:n	. zagr/zagir	.	.
.			
. zilag	‘to slip’		
. zligat	. zligaw	. zilagt	. zilagtaj
. zilagtaw	. zilagt	. zilagna	. jizlag
. tizlag	. jizligu:n	. tizlag	. tizligi:n
. tizligu:n	. ʔazlag	. nizlag	. zlig
. zilgaj	. zilgaw	. za:lig	. za:lga
. za:lgi:n	. zalg/zalag	.	.
.			
. zragg	‘to turn blue’		
. zraggat	. zraggaw	. zragge:t	. zragge:taj
. zragge:taw	. zragge:t	. zragge:na	. jizragg
. tizragg	. jizraggo:n	. tizragg	. tizragge:n
. tizraggo:n	. ʔazragg	. nizragg	. zragg
. zraggaj	. zraggaw	. mizragg	. mizragga
. mizraggi:n	.	.	.
.			
/s/			
. sagi:	‘high tide’		
. sagf	‘ceiling’		
. sagfe:n	(dual)		
. sgu:f	(pl.)		
. sakan	‘residence’		
. samande:ga	‘useless’		
. sambu:k	‘a type of boats’		
. samma:tʃ	‘fisherman’		
. samma:tʃe:n	(dual)		
. sima:mi:tʃ	(pl.)		

. samma:tʃa	(f.)
. samma:tʃte:n	(dual f.)
. samma:tʃa:t	(pl. f.)
. sawwa:g	‘driver’
. sawwa:ge:n	(dual)
. siwa:wi:g	(pl.)
. sawwa:gi:n	(pl.)
. sawwa:ga	(f.)
. sawwa:gte:n	(dual f.)
. sawwa:ga:t	(pl. f.)
. sadʒda◊	‘a bow’
. sadʒdite:n◊	(dual)
. sadʒda:t◊	(pl.)
. sajja:da	‘prayer rug’
. sajja:dte:n	(pl.)
. saja:ji:d/sija:ji:d	(pl.)
. sa:g	‘leg’
. sa:ge:n	(dual)
. si:ga:n	(pl.)
. sa:gi:	‘waterwheel, rivulet’
. sa:gi:je:n	(dual)
. siwa:gi:	(pl.)
. sa:gu:	‘a traditional dessert’
. sa:kin	‘dweller’
. sa:kine:n	(dual)
. sa:kna	(f.)
. sa:knite:n	(dual f.)
. sikka:n	(pl.)
. sibi:tʃa	‘p.n. (f.)’
. sibi:tʃa	‘ingot’
. sibi:tʃte:n	(dual)
. siba:jiʃ	(pl.)
. sitʃʃi:n(a)	‘knife’
. sitʃʃi:nte:n	(dual)
. sitʃa:tʃi:n	(pl.)
. sakra:n	‘drunk’

. sakra:na	(f.)		
. sika:ra	(pl.)		
. sikka:n	‘steering wheel’		
. sikki:na	‘knife’		
. sikki:nte:n	(dual)		
. sika:ki:n	(pl.)		
. simatʃ	‘fish’		
. smitʃa	(singular)		
. smitʃte:n	(dual)		
. smitʃa:t	(pl.)		
. simak/samak	‘fish’		
. smika	(f.)		
. smikte:n	(dual)		
.	(pl.)		
. sikka	‘street’		
. sikkite:n	(dual)		
. siki:k	(pl.)		
. sidʒin	‘jail’		
. sidʒne:n	(dual)		
. sdʒu:n	(pl.)		
. stika:na	‘tea cup’		
. stika:nte:n	(dual)		
. stika:na:t	(pl.)		
. ska:r	‘a kind of fish’		
. sadʒdʒal	‘to register’		
. sadʒdʒilat	. sadʒdʒilaw	. sadʒdʒalt	. sadʒdʒaltaj
. sadʒdʒaltaw	. sadʒdʒalt	. sadʒdʒalna	. jsadʒdʒil
. tsadʒdʒil	. jsadʒlu:n	. tsadʒdʒil	. tsadʒli:n
. tsadʒlu:n	. ʔasadʒdʒil	. nsadʒdʒil	. sadʒdʒil
. sadʒlaj	. sadʒlaw	. msadʒdʒil	. msadʒla
. msadʒli:n	. tasdʒi:l	. msadʒdʒal	. msadʒdʒila
. msadʒdʒali:n			
. sakkat	‘to silence (transitive)’		
. sakkitat	. sakkitaw	. sakkatt	. sakkattaj
. sakkattaw	. sakkatt	. sakkatna	. jsakkit
. tsakkit	. jsaktu:n	. tsakkit	. tsakti:n
. tsakktu:n	. ʔasakkit	. nsakkit	. sakkit
. saktaj	. saktaw	. msakkit	. msakta
. msakti:n	.	.	.

. sakkar	‘to close’		
. sakkirat	. sakkiraw	. sakkart	. sakkartaj
. sakkartaw	. sakkart	. sakkarna	. jsakkir
. tsakkir	. jsakru:n	. tsakkir	. tsakri:n
. tsakru:n	. ?asakkir	. nsakkir	. sakkir
. sakraj	. sakraw	. msakkir	. msakra
. msakri:n	.	. msakkar	. msakkira
. msakkari:n			
. sid3ad◇	‘to bow’		
. sd3idat◇	. sd3idaw◇	. sid3adt◇	. sid3adtaj◇
. sid3adtaw◇	. sid3adt◇	. sid3adna◇	. jisd3id◇
. tisd3id◇	. jisd3idu:n◇	. tisd3id◇	. tisd3idi:n◇
. tisd3idu:n◇	. ?asd3id◇	. nisd3id◇	. sd3id◇
. sd3idaj◇	. sd3idaw◇	. sa:d3id◇	. sa:d3da◇
. sa:d3di:n◇	. sid3u:d◇	.	.
.			
. sa:g	‘to drive’		
. sa:gat	. sa:gaw	. sigt	. sigtaj
. sigtaw	. sigt	. signa	. jsu:g
. tsu:g	. jsu:gu:n	. tsu:g	. tsu:gi:n
. tsu:gu:n	. ?asu:g	. nsu:g	. su:g
. su:gaj	. su:gaw	. sa:jig	. sa:jga
. sa:jgi:n	. siwa:ga	.	.
.			
. sid3an	‘to imprison’		
. sd3inat	. sd3inaw	. sid3ant	. sid3antaj
. sid3antaw	. sid3ant	. sid3anna	. jasd3in
. tasd3in	. jasd3inu:n	. tasd3in	. tasd3ini:n
. tasd3inu:n	. ?asd3in	. nasd3in	. sd3in
. sid3naj	. sid3naw	. sa:d3in	. sa:d3na
. sa:d3ni:n	. sid3n/sid3in	. masd3u:n	. masd3u:na
. masd3u:ni:n			
. siga	‘to water’		
. sigat	. sigaw	. sige:t	. sige:taj
. sige:taw	. sige:t	. sige:na	. jasgi:
. tasgi:	. jasgo:n	. tasgi:	. tasge:n
. tasgo:n	. ?asgi:	. nasgi:	. sg(i)

. sgaj	. sgaw	. sa:gi:	. sa:gja
. sa:gji:n	. sagi:	.	.
.			
. sikat	‘to stop talking’		
. skitat	. skitaw	. sikatt	. sikattaj
. sikattaw	. sikatt	. sikatna	. jaskit
. taskit	. jaskitu:n	. taskit	. taskiti:n
. taskitu:n	. ?askit	. naskit	. skit
. siktaj	. siktaj	. sa:kit	. sa:kta
. sa:kti:n	. siku:t	. masku:t (ʔanna)	. masku:t (ʔanha)
. masku:t (ʔanhum)			
. sikar	‘to be drunk’		
. skirat	. skiraw	. sikart	. sikartaj
. sikartaw	. sikart	. sikarna	. jiskar
. tiskar	. jiskiru:n	. tiskar	. tiskiri:n
. tiskiru:n	. ?askar	. niskar	. skar
. skiraj	. skiraw	.	.
.	.	.	.
.			
. sikan	‘to dwell/rside’		
. skinat	. skinaw	. sikant	. sikantaj
. sikantaw	. sikant	. sikanna	. jiskin
. tiskin	. jiskinu:n	. tiskin	. tiskini:n
. tiskinu:n	. ?askin	. niskin	. skin
. siknaj	. siknaw	. sa:kin	. sa:kna
. sa:kni:n	. sakan	. masku:n	. masku:na
. masku:ni:n			
. stabga	‘to detain’		
. stabgat	. stabgaw	. stabge:t	. stabge:taj
. stabge:taw	. stabge:t	. stabge:na	. jistabgi:
. tistabgi:	. jistabgo:n	. tistabgi:	. tistabge:n
. tistabgo:n	. ?astabgi:	. nistabgi:	. stabg(i)
. stabgaj	. stabgaw	. mistabgi:	. mistabgija
. mistabgi:n	.	.	.
.			
. staθgal <sup>ʔ</sup>	‘to find heavy’		
. staθgl <sup>ʔ</sup> at	. staθgl <sup>ʔ</sup> aw	. staθgl <sup>ʔ</sup> at	. staθgl <sup>ʔ</sup> ataj
. staθgl <sup>ʔ</sup> ataw	. staθgl <sup>ʔ</sup> at	. staθgl <sup>ʔ</sup> na	. jistaθgl <sup>ʔ</sup>
. tistaθgl <sup>ʔ</sup>	. jistaθgl <sup>ʔ</sup> u:n	. tistaθgl <sup>ʔ</sup>	. tistaθgl <sup>ʔ</sup> i:n
. tistaθgl <sup>ʔ</sup> u:n	. ?astaθgl <sup>ʔ</sup>	. nistaθgl <sup>ʔ</sup>	. staθgl <sup>ʔ</sup>

. staθgəl <sup>ʰ</sup> aj	. staθgəl <sup>ʰ</sup> aw	. mistaθgəl <sup>ʰ</sup>	. mistaθgəl <sup>ʰ</sup> a
. mistaθgəl <sup>ʰ</sup> i:n	.	.	.
.			
. staħmag	‘to be mad’		
. staħmigat	. staħmigaw	. staħmagt	. staħmagtaj
. staħmagtaw	. staħmagt	. staħmagna	. jistaħmag
. tistaħmag	. jistaħmigo:n	. tistaħmag	. tistaħmige:n
. tistaħmigo:n	. ʔastaħmag	. nistaħmag	. staħmag
. staħmigaj	. staħmigaw	. mistaħmig	. mistaħmiga
. mistaħmigi:n	.	.	.
.			
. starzag	‘to seek one’s livelihood’		
. starzigat	. starzigaw	. starzagt	. starzagtaj
. starzagtaw	. starzagt	. starzagna	. jistarzig
. jistarzig	. jistarzigo:n	. tistarzig	. tistarzige:n
. tistarzigo:n	. ʔastarzig	. nistarzig	. starzag
. starzigaj	. starzigaw	. mistarzig	. mistarziga
. mistarzigi:n	.	.	.
.			
. staŋjal	‘to hurry’		
. staŋjilat	. staŋjilaw	. staŋjalt	. staŋjaltaj
. staŋjaltaw	. staŋjalt	. staŋjalna	. jistaŋjil
. tistaŋjil	. jistaŋjilo:n	. tistaŋjil	. tistaŋjile:n
. tistaŋjilo:n	. ʔastaŋjil	. nistaŋjil	. staŋjil
. staŋjilaj	. staŋjilaw	. mistaŋjil	. mistaŋjila
. mistaŋjili:n	. stiŋja:l	.	.
.			
. stakθar	‘to exorbitant’		
. stakθirat	. stakθiraw	. stakθart	. stakθartaj
. stakθiraw	. stakθart	. stakθarna	. jistakθir
. tistakθir	. jistakθiro:n	. tistakθir	. tistakθire:n
. tistakθiro:n	. ʔastakθir	. nistakθir	. stakθir
. stakθiraj	. stakθiraw	. mistakθir	. mistakθira
. mistakθiri:n	. stikθa:r	.	.
.			
. stidʒa:b	‘to respond’		
. stidʒa:bat	. stidʒa:baw	. stidʒabt	. stidʒabtaj
. stidʒabtaw	. stidʒabt	. stidʒabna	. jistidʒi:b



. tistidʒi:b	. jistidʒi:bu:n	. tistidʒi:b	. tistidʒi:bi:n
. tistidʒi:bu:n	. ʔastidʒi:b	. nistidʒi:b	. stidʒi:b
. stidʒi:baj	. stidʒi:baw	. mistidʒi:b	. mistidʒi:ba
. mistidʒi:bi:n	. stidʒa:ba	. mistidʒa:b	. mistidʒa:b
.			

/ʃ/

. ʃabatʃ	‘fishing net’
. sabatʃe:n	(dual)
. ʃba:tʃ	(pl.)
. ʃabak	‘fishing net’
. ʃabake:n	(dual)
. ʃba:k	(pl.)
. ʃarg	‘east’
. ʃargi:	‘eastern’
. ʃargi:je:n	(dual)
. ʃargi:ji:n	(pl.)
. ʃargi:ja	(f.)
. ʃargi:te:n	(dual f.)
. ʃargi:ja:t	(pl. f.)
. ʃagha	‘a skip’
. ʃagħite:n	(dual)
. ʃagħa:t	(pl.)
. ʃagg	‘tear, crack’
. ʃagge:n	(dual)
. ʃgu:g	(pl.)
. ʃagja:n	‘hardworking’
. ʃagja:na	(f.)
. ʃagja:ni:n	(pl.)
. ʃakil/ʃakl	‘shape, appearance’
. ʃakle:n	(dual)
. ʔaʃka:l	(pl.)
. ʃakk	‘impaling’
. ʃakwa	‘complaining’
. ʃakwa	‘a complain’
. ʃakwite:n	(dual)
. ʃaka:wi:	(pl.)

. ʃahga	‘a sigh’
. ʃahgite:n	(dual)
. ʃahga:t	(pl.)
. ʃo:tʃ	‘thorns’
. ʃo:tʃta	(singular)
. ʃo:tʃte:n	(dual)
. ʃo:tʃa:t	(pl.)
. ʃo:k	‘thorns’
. ʃo:kta	(singular)
. ʃo:kte:n	(dual)
. ʃo:ka:t	(pl.)
. ʃo:ka	‘a fork’
. ʃo:kte:n	(dual)
. ʃwak	(pl.)
. ʃibba:k	‘window’
. ʃibba:ke:n	(dual)
. ʃiba:bi:k	(pl.)
. ʃiru:g	‘sun rising’
. ʃiri:tʃ °	‘partner’
. ʃiri:tʃe:n °	(dual)
. ʃara:jitʃ °	(pl.)
. ʃiri:k °	‘partner’
. ʃiri:ke:n °	(dual)
. ʃara:jik °	(pl.)
. ʃirka/ʃarika	‘a company’
. ʃarkite:n	(dual)
. ʃarika:t/ʃirka:t	(pl.)
. ʃigga	‘apartment’
. ʃiggite:n	(dual)
. ʃigag	(pl.)
. ʃikar	‘sugar’
. ʃijar	‘trees’
. ʃjara	(f.)
. ʃjarte:n	(dual)
. ʃjara:t	(pl.)
. ʃ ʰagga	‘for what?’
. ʃ kibir	‘how big’

. ʃadʒdʒaɪ	‘to cheer’		
. ʃadʒdʒɪfət	. ʃadʒdʒɪfaw	. ʃadʒdʒaɪt	. ʃadʒdʒaɪtaj
. ʃadʒdʒaɪtaw	. ʃadʒdʒaɪt	. ʃadʒdʒaɪna	. jʃadʒdʒɪf
. tʃadʒdʒɪf	. jʃadʒɪu:n	. tʃadʒdʒɪf	. tʃadʒɪi:n
. tʃadʒɪu:n	. ʔaʃadʒdʒɪf	. nʃadʒdʒɪf	. ʃadʒdʒɪf
. ʃadʒɪiaj	. ʃadʒɪaw	. mʃadʒdʒɪf	. mʃadʒɪa
. mʃadʒɪi:n	. taʃdʒɪ:f	.	.
.			
. ʃagg	‘to tear’		
. ʃaggat	. ʃaggaw	. ʃagge:t	. ʃagge:taj
. ʃagge:taw	. ʃagge:t	. ʃagge:na	. jʃigg
. tʃigg	. jʃiggu:n	. tʃigg	. tʃiggi:n
. tʃiggu:n	. ʔaʃigg	. nʃigg	. ʃigg
. ʃiggaj	. ʃiggaw	. ʃɑ:gg	. ʃɑ:gga
. ʃɑ:ggi:n	. ʃagg	. maʃgu:g	. maʃgu:ga
. maʃgu:gi:n			
.			
. ʃaggar	‘to cause to be blond’		
. ʃaggirat	. ʃaggiraw	. ʃaggart	. ʃaggartaj
. ʃaggartaw	. ʃaggart	. ʃaggarna	. jʃaggir
. tʃaggir	. jsagru:n	. tʃaggir	. tʃagri:n
. tʃagru:n	. ʔaʃaggir	. nʃaggir	. ʃaggir
. ʃagraj	. ʃagraw	. mʃaggir	. mʃagra
. mʃagri:n	. taʃgi:r	.	.
.			
. ʃaggag	‘to tear repeatedly’		
. ʃaggigat	. ʃaggigaw	. ʃaggagt	. ʃaggagtaj
. ʃaggagtaw	. ʃaggagt	. ʃaggagna	. jʃaggig
. tʃaggig	. jʃaggigu:n	. tʃaggig	. tʃaggifi:n
. tʃaggigu:n	. ʔaʃaggig	. nʃaggig	. ʃaggig
. ʃaggigaj	. ʃaggigaw	. mʃaggig	. mʃaggiga
. mʃaggigi:n	. taʃggi:g	. mʃaggag	. mʃaggiga
. mʃaggagi:n			
.			
. ʃakk	‘to doubt’		
. ʃakkat	. ʃakkaw	. ʃakke:t	. ʃakke:taj
. ʃakke:taw	. ʃakke:t	. ʃakke:na	. jʃikk
. tʃikk	. jʃikku:n	. tʃikk	. tʃikki:n
. tʃikku:n	. ʔaʃikk	. nʃikk	. ʃikk

. ʃikkaj	. ʃikkaw	. ʃɑ:kk	. ʃɑ:kka
. ʃɑ:kki:n	. ʃakk	. maʃku:k fi:h	. maʃku:k fi:ha
. maʃku:k fi:hum			
. ʃakk	‘to impale’		
. ʃakkat	. ʃakkaw	. ʃakke:t	. ʃakke:taj
. ʃakke:taw	. ʃakke:t	. ʃakke:na	. jʃikk
. tʃikk	. jʃikku:n	. tʃikk	. tʃikki:n
. tʃikku:n	. ʔaʃikk	. nʃikk	. ʃikk
. ʃikki:	. ʃikkaw	. ʃɑ:kk	. ʃɑ:kka
. ʃɑ:kki:n	. ʃakk	. maʃku:k	. maʃku:ka
. maʃku:ki:n			
. ʃɑ:ratʃ	‘to share’		
. ʃɑ:ritʃat	. ʃɑ:ritʃaw	. ʃɑ:ratʃt	. ʃɑ:ratʃtaj
. ʃɑ:ratʃtaw	. ʃɑ:ratʃt	. ʃɑ:ratʃna	. jʃɑ:ritʃ
. tʃɑ:ritʃ	. jʃɑ:rtʃu:n	. tʃɑ:ritʃ	. tʃɑ:rtʃi:n
. tʃɑ:rtʃu:n	. ʔaʃɑ:ritʃ	. nʃɑ:ritʃ	. ʃɑ:ritʃ
. ʃɑ:rtʃaj	. ʃɑ:rtʃaw	. mʃɑ:ritʃ	. mʃɑ:rtʃa
. mʃɑ:rtʃi:n	. ʃɑ:rtʃa/ʃirtʃa	.	.
.			
. ʃɑ:rak	‘to share’		
. ʃɑ:rikat	. ʃɑ:rikaw	. ʃɑ:rakt	. ʃɑ:raktaj
. ʃɑ:raktaw	. ʃɑ:rakt	. ʃɑ:rakna	. jʃɑ:rik
. tʃɑ:rik	. jʃɑ:rku:n	. tʃɑ:rik	. tʃɑ:rki:n
. tʃɑ:rku:n	. ʔaʃɑ:rik	. nʃɑ:rik	. ʃɑ:rik
. ʃɑ:rkaj	. ʃɑ:rkaw	. mʃɑ:rik	. mʃɑ:rka
. mʃɑ:rki:n	. ʃɑ:rkɑ/ʃirka	.	.
.			
. ʃiga	‘to have hardship’		
. ʃigat	. ʃigaw	. ʃige:t	. ʃige:taj
. ʃige:taw	. ʃige:t	. ʃige:na	. jiʃga
. tiʃga	. jiʃgu:n	. tiʃga	. tiʃgi:n
. tiʃgu:n	. ʔaʃga	. niʃga	. ʃg(a)
. ʃgaj	. ʃgaw	.	.
.	. ʃiga	.	.
.			
. ʃigaħ	‘to jump over, skip’		
. ʃgiħat	. ʃgiħaw	. ʃigaħt	. ʃigaħtaj

. ſigahtaw	. ſigaht	. ſigahna	. jiſgah
. tiſgah	. jiſgihu:n	. tiſgah	. tiſgihi:n
. tiſgihu:n	. ?aſgah	. niſgah	. ſgah
. ſighaj	. ſighaw	. ſa:gih	. ſa:għa
. ſa:għi:n	. ſagħ/ſagih	.	.
.			
. ſikar	‘to thank’		
. ſkirat	. ſkiraw	. ſikart	. ſikartaj
. ſikartaw	. ſikart	. ſikarna	. jiſkir
. tiſkir	. jiſkiru:n	. tiſkir	. tiſkiri:n
. tiſkiru:n	. ?aſkir	. niſkir	. ſkir
. ſikraj	. ſikraw	. ſa:kir	. ſa:kra
. ſa:kri:n	. ſikr/ſikir	. maſku:r	. maſku:ra
. maſku:ri:n			
. ſinag	‘to hang, excute’		
. ſnigat	. ſnigaw	. ſinagt	. ſinagtaj
. ſinagtaw	. ſinagt	. ſinagna	. jiſnig
. tiſnig	. jiſnigu:n	. tiſnig	. tiſnigi:n
. tiſnigu:n	. ?aſnig	. niſnig	. ſnig
. ſinigaj	. ſingaw	. ſa:nig	. ſa:nga
. ſa:ngi:n	. ſang	. maſnu:g	. maſnu:ga
. maſnu:gi:n			
. ſihag	‘to sigh’		
. ſhigat	. ſhigaw	. ſihagt	. ſihagtaj
. ſihagtaw	. ſihagt	. ſihagna	. jiſhag
. tiſhag	. jiſhigu:n	. tiſhag	. tiſhigi:n
. tiſhigu:n	. ?aſhag	. niſhag	. ſhag
. ſhigaj	. ſhigaw	.	.
.	.	.	.
.			
. ſtika	‘to complain’		
. ſtikat	. ſtikaw	. ſtike:t	. ſtike:taj
. ſtike:taw	. ſtike:t	. ſtike:na	. jiſtiki:
. tiſtiki:	. jiſtiko:n	. tiſtiki:	. tiſtike:n
. tiſtiko:n	. ?aſtiki:	. niſtiki:	. ſtik
. ſtikaj	. ſtikaw	. miſtiki:	. miſtakja
. miſtiki:n/miſtakji:n	.	.	.

.			
/sʰ/			
. sʰatʃma	‘a kind of rifles’		
. sʰatʃmite:n	(dual)		
. sʰətʃam/sʰtʃam	(pl.)		
. sʰafga	‘a clap’		
. sʰafgite:n	(dual)		
. sʰafga:t	(pl.)		
. sʰagir	‘falcon’		
. sʰagre:n	(dual)		
. sʰgu:r	(pl.)		
. sʰakka	‘jail-like’		
. sʰandiga	‘hut’		
. sʰandigte:n	(dual)		
. sʰanadig	(pl.)		
. sʰa:dʒdʒ	‘truthful’		
. sʰa:dʒdʒa	(f.)		
. sʰa:dʒdʒi:n	(pl.)		
. sʰədʒdʒ	‘true’		
. sʰədi:g/sʰədi:dʒ	‘friend’		
. sʰədi:ge:n	(dual)		
. sʰədi:dʒe:n	(dual)		
. sʰədi:ga/sʰədi:dʒa	(f.)		
. sʰədi:gte:n	(dual f.)		
. sʰədi:dʒte:n	(dual f.)		
. sʰəndu:g	‘box’		
. sʰəndu:ge:n	(dual)		
. sʰana:di:g	(pl.)		
. sʰaddag	‘to believe’		
. sʰaddigat	. sʰaddigaw	. sʰaddagt	. sʰaddagtaj
. sʰaddagtaw	. sʰaddagt	. sʰaddagna	. jsʰaddig
. tsʰaddig	. jsʰaddgu:n	. tsʰaddig	. tsʰadgi:n
. tsʰaddgu:n	. ?asʰaddig	. nsʰaddig	. sʰaddig
. sʰadgaj	. sʰadgaw	. msʰaddig	. msʰadga
. msʰadgi:n	. tasʰdi:g	.	.
.			
. sʰaffag	‘to clap the hands’		

. s <sup>ʰ</sup> affigat	. s <sup>ʰ</sup> affigaw	. s <sup>ʰ</sup> affagt	. s <sup>ʰ</sup> affagtaj
. s <sup>ʰ</sup> affagtaw	. s <sup>ʰ</sup> affagt	. s <sup>ʰ</sup> affagna	. js <sup>ʰ</sup> affig
. ts <sup>ʰ</sup> affig	. js <sup>ʰ</sup> affigu:n	. ts <sup>ʰ</sup> affig	. ts <sup>ʰ</sup> afgi:n
. ts <sup>ʰ</sup> afgu:n	. ʔas <sup>ʰ</sup> affig	. ns <sup>ʰ</sup> affig	. s <sup>ʰ</sup> affig
. s <sup>ʰ</sup> afgaj	. s <sup>ʰ</sup> afgaw	. ms <sup>ʰ</sup> affig	. ms <sup>ʰ</sup> afga
. ms <sup>ʰ</sup> afgi:n	. tas <sup>ʰ</sup> fi:g	.	.
.			
. s <sup>ʰ</sup> akk	‘to close’		
. s <sup>ʰ</sup> akkat	. s <sup>ʰ</sup> akkaw	. s <sup>ʰ</sup> akke:t	. s <sup>ʰ</sup> akke:taj
. s <sup>ʰ</sup> akke:taw	. s <sup>ʰ</sup> akke:t	. s <sup>ʰ</sup> akke:na	. js <sup>ʰ</sup> əkk
. ts <sup>ʰ</sup> əkk	. js <sup>ʰ</sup> əkku:n	. ts <sup>ʰ</sup> əkk	. ts <sup>ʰ</sup> əkki:n
. ts <sup>ʰ</sup> əkku:n	. ʔas <sup>ʰ</sup> əkk	. ns <sup>ʰ</sup> əkk	. s <sup>ʰ</sup> əkk
. s <sup>ʰ</sup> əkkaj	. s <sup>ʰ</sup> əkkaw	. s <sup>ʰ</sup> a:kk	. s <sup>ʰ</sup> a:kka
. s <sup>ʰ</sup> a:kki:n	. s <sup>ʰ</sup> akk	. mas <sup>ʰ</sup> ku:k	. mas <sup>ʰ</sup> ku:ka
. mas <sup>ʰ</sup> ku:ki:n			
.			
. s <sup>ʰ</sup> akkak	‘to close repeatedly’		
. s <sup>ʰ</sup> akkikat	. s <sup>ʰ</sup> akkikaw	. s <sup>ʰ</sup> akkakt	. s <sup>ʰ</sup> akkaktaj
. s <sup>ʰ</sup> akkaktaw	. s <sup>ʰ</sup> akkakt	. s <sup>ʰ</sup> akkakna	. js <sup>ʰ</sup> akkik
. ts <sup>ʰ</sup> akkik	. js <sup>ʰ</sup> akkiku:n	. ts <sup>ʰ</sup> akkik	. ts <sup>ʰ</sup> akkiki:n
. ts <sup>ʰ</sup> akkiku:n	. ʔas <sup>ʰ</sup> akkik	. ns <sup>ʰ</sup> akkik	. s <sup>ʰ</sup> akkik
. s <sup>ʰ</sup> akkikaj	. s <sup>ʰ</sup> akkikaw	. ms <sup>ʰ</sup> akkik	. ms <sup>ʰ</sup> akkika
. ms <sup>ʰ</sup> akkiki:n	. tas <sup>ʰ</sup> aki:k	.	.
.			
. s <sup>ʰ</sup> əfag	‘to slam, slap’		
. s <sup>ʰ</sup> fəgat	. s <sup>ʰ</sup> figaw	. s <sup>ʰ</sup> əfagt	. s <sup>ʰ</sup> əfagtaj
. s <sup>ʰ</sup> əfagtaw	. s <sup>ʰ</sup> əfagt	. s <sup>ʰ</sup> əfagna	. jas <sup>ʰ</sup> fig
. tas <sup>ʰ</sup> fəg	. jas <sup>ʰ</sup> figu:n	. tas <sup>ʰ</sup> fig	. tas <sup>ʰ</sup> figi:n
. tas <sup>ʰ</sup> figu:n	. ʔas <sup>ʰ</sup> fig	. nas <sup>ʰ</sup> fig	. s <sup>ʰ</sup> fəg
. s <sup>ʰ</sup> əfgaj	. s <sup>ʰ</sup> əfgaw	. s <sup>ʰ</sup> a:fig	. s <sup>ʰ</sup> a:fga
. s <sup>ʰ</sup> a:fgi:n	. s <sup>ʰ</sup> afg	. mas <sup>ʰ</sup> fu:g	. mas <sup>ʰ</sup> fu:ga
. mas <sup>ʰ</sup> fu:gi:n			
.			
/t <sup>ʰ</sup> /			
. t <sup>ʰ</sup> art <sup>ʰ</sup> angi:	‘worthless’		
. t <sup>ʰ</sup> art <sup>ʰ</sup> angi:ja	(f.)		
. t <sup>ʰ</sup> art <sup>ʰ</sup> angi:ja	(pl.)		
. t <sup>ʰ</sup> agŋa	‘a fart’		
. t <sup>ʰ</sup> agŋite:n	(dual)		

. tʰagɿa:t	(pl.)		
. tʰala:g	‘divorce’		
. tʰəri:g/tʰəri:dʒ	‘road’		
. tʰəri:ge:n/tʰəri:dʒe:n	(dual)		
. tʰurug	(pl.)		
. tʰa:gi:ja	‘hat’		
. tʰa:gi:te:n	(dual)		
. tʰa:gi:ja:t	(pl.)		
. tʰəwa:gi:	(pl.)		
. tʰra:g	‘a slap’		
. tʰra:ge:n	(dual)		
. tʰra:ga:t	(pl.)		
. tʰagtʰag	‘to knock repeatedly’		
. tʰagtʰəgat	. tʰagtʰəgaw	. tʰagtʰagt	. tʰagtʰagtaj
. tʰagtʰagtag	. tʰagtʰagt	. tʰagtʰagna	. jtʰagtʰəg
. ttʰagtʰəg	. jtʰagtʰəgu:n	. ttʰagtʰəg	. ttʰagtʰəgi:n
. ttʰagtʰəgu:n	. ʔatʰagtʰəg	. ntʰagtʰəg	. tʰagtʰəg
. tʰagtʰəgaj	. tʰagtʰəgaw	. mtʰagtʰəg	. mtʰagtʰəga
. mtʰagtʰəgi:n	. tʰagtʰəga	.	.
.			
. tʰagg	‘to hit, knock’		
. tʰaggat	. tʰaggaw	. tʰagge:t	. tʰagge:taj
. tʰagge:taw	. tʰagge:t	. tʰagge:na	. jtʰəgg
. ttʰəgg	. jtʰəgggu:n	. ttʰəgg	. ttʰəggi:n
. ttʰəgggu:n	. ʔatʰəgg	. ntʰəgg	. tʰəgg
. tʰəggaj	. tʰəggaw	. tʰa:gg	. tʰa:gga
. tʰa:ggi:n	. tʰagg	.	.
.			
. tʰaggaɿ	‘to be inattentive’		
. tʰaggaɿat	. tʰaggaɿaw	. tʰaggaɿt	. tʰaggaɿtaj
. tʰaggaɿtaw	. tʰaggaɿt	. tʰaggaɿna	. jtʰaggaɿ
. ttʰaggaɿ	. jtʰaggaɿu:n	. ttʰaggaɿ	. ttʰaggaɿi:n
. ttʰaggaɿu:n	. ʔatʰaggaɿ	. ntʰaggaɿ	. tʰaggaɿ
. tʰaggaɿaj	. tʰaggaɿaw	. mtʰaggaɿ	. mtʰaggaɿa
. mtʰaggaɿi:n	. tatʰgi:ɿ	.	.
.			
. tʰallag	‘to divorce’		



. tʰalligat	. tʰalligaw	. tʰallagt	. tʰallagtaj
. tʰallagtaw	. tʰallagt	. tʰallagna	. jtʰallig
. ttʰallig	. jtʰalgu:n	. ttʰallig	. ttʰalgi:n
. ttʰalgu:n	. ?atʰallig	. ntʰallig	. tʰallig
. tʰalgaj	. tʰalgaw	. mtʰallig	. mtʰalga
. mtʰalgi:n	. tʰala:g	. mtʰallag	. mtʰalliga
. mtʰallagi:n			
. tʰangar	‘to become angry’		
. tʰangirat	. tʰangiraw	. tʰangart	. tʰangartaj
. tʰangartaw	. tʰangart	. tʰangarna	. jtʰangir
. ttʰangir	. jtʰangiru:n	. ttʰangir	. ttʰangiri:n
. ttʰangiru:n	. ?atʰangir	. ntʰangir	. tʰangir
. tʰangiraj	. tʰangiraw	. mtʰangir	. mtʰangira
. mtʰangiri:n	. tʰangira	.	.
.			

/ðʰ/

. ðʰadʒdʒa	‘noise’		
. ðʰajjidʒ	‘tight, narrow’		
. ðʰajdʒa	(f)		
. ðʰajdʒa/ðʰajdʒi:n	(pl.)		
. ðʰajjig	‘tight, narrow’		
. ðʰajga	(f.)		
. ðʰajga/ðʰajgi:n	(pl.)		
. ðʰihka	‘a laugh’		
. ðʰihkite:n	(dual)		
. ðʰihka:t	(pl.)		
. ðʰawwag	‘to tighten’		
. ðʰawwigat	. ðʰawwigaw	. ðʰawwagt	. ðʰawwagtaj
. ðʰawwagtaw	. ðʰawwagt	. ðʰawwagna	. jðʰawwig
. tðʰawwig	. jðʰawgu:n	. tðʰawwig	. tðʰawgi:n
. tðʰawgu:n	. ?aðʰawwig	. nðʰawwig	. ðʰawwig
. ðʰawgaj	. ðʰawgaw	. mðʰawwig	. mðʰawga
. mðʰawgi:n	. taðʰwi:g	. mðʰawwag	. mðʰawwiga
. mðʰawwagi:n			
. ðʰajjadʒ	‘to tighten’		
. ðʰajjidʒat	. ðʰajjidʒaw	. ðʰajjadʒt	. ðʰajjadʒtaj
. ðʰajjadʒtaw	. ðʰajjadʒt	. ðʰajjadʒna	. jðʰajjidʒ

. t <sup>ʃ</sup> ajjidz	. j <sup>ʃ</sup> ajdzu:n	. t <sup>ʃ</sup> ajjidz	. t <sup>ʃ</sup> ajdzi:n
. t <sup>ʃ</sup> ajdzu:n	. ʔa <sup>ʃ</sup> ajjidz	. n <sup>ʃ</sup> ajjidz	. <sup>ʃ</sup> ajjidz
. <sup>ʃ</sup> ajdzaj	. <sup>ʃ</sup> ajdzaw	. m <sup>ʃ</sup> ajjidz	. m <sup>ʃ</sup> ajdza
. m <sup>ʃ</sup> ajdzi:n	. ta <sup>ʃ</sup> ji:dz	.	.
.			
. <sup>ʃ</sup> ajjag	‘to tighten’		
. <sup>ʃ</sup> ajjigat	. <sup>ʃ</sup> ajjigaw	. <sup>ʃ</sup> ajjagt	. <sup>ʃ</sup> ajjagtaj
. <sup>ʃ</sup> ajjagtaw	. <sup>ʃ</sup> ajjagt	. <sup>ʃ</sup> ajjagna	. j <sup>ʃ</sup> ajjiḡ
. t <sup>ʃ</sup> ajjiḡ	. j <sup>ʃ</sup> ajgu:n	. t <sup>ʃ</sup> ajjiḡ	. t <sup>ʃ</sup> ajji:n
. t <sup>ʃ</sup> ajgu:n	. ʔa <sup>ʃ</sup> ajjiḡ	. n <sup>ʃ</sup> ajjiḡ	. <sup>ʃ</sup> ajjiḡ
. <sup>ʃ</sup> ajgaj	. <sup>ʃ</sup> ajgaw	. m <sup>ʃ</sup> ajjiḡ	. m <sup>ʃ</sup> ajga
. m <sup>ʃ</sup> ajji:n	. ta <sup>ʃ</sup> ji:g	.	.
.			
. <sup>ʃ</sup> a:dz	‘to become tight’		
. <sup>ʃ</sup> a:dzat	. <sup>ʃ</sup> a:dzaw	. <sup>ʃ</sup> ədzt	. <sup>ʃ</sup> ədztaj
. <sup>ʃ</sup> ədztaw	. <sup>ʃ</sup> ədzt	. <sup>ʃ</sup> ədzna	. j <sup>ʃ</sup> i:dz
. t <sup>ʃ</sup> i:dz	. j <sup>ʃ</sup> i:dzu:n	. t <sup>ʃ</sup> i:dz	. t <sup>ʃ</sup> i:dzi:n
. t <sup>ʃ</sup> i:dzu:n	. ʔa <sup>ʃ</sup> i:dz	. n <sup>ʃ</sup> i:dz	. <sup>ʃ</sup> i:dz
. <sup>ʃ</sup> i:dzaj	. <sup>ʃ</sup> i:dzaw	. <sup>ʃ</sup> a:jidz	. <sup>ʃ</sup> a:jdza
.	. <sup>ʃ</sup> i:dz	.	.
.			
. <sup>ʃ</sup> a:g	‘to become tight’		
. <sup>ʃ</sup> a:gat	. <sup>ʃ</sup> a:gaw	. <sup>ʃ</sup> əgt	. <sup>ʃ</sup> əgtaj
. <sup>ʃ</sup> əgtaw	. <sup>ʃ</sup> əgt	. <sup>ʃ</sup> əgna	. j <sup>ʃ</sup> i:g
. t <sup>ʃ</sup> i:g	. j <sup>ʃ</sup> i:gu:n	. t <sup>ʃ</sup> i:g	. t <sup>ʃ</sup> i:gi:n
. t <sup>ʃ</sup> i:gu:n	. ʔa <sup>ʃ</sup> i:g	. n <sup>ʃ</sup> i:g	. <sup>ʃ</sup> i:g
. <sup>ʃ</sup> i:gaj	. <sup>ʃ</sup> i:gaw	. <sup>ʃ</sup> a:jiḡ	. <sup>ʃ</sup> a:jga
.	. <sup>ʃ</sup> i:g	.	.
.			
. <sup>ʃ</sup> a:jag	‘to bother’		
. <sup>ʃ</sup> a:jiḡat	. <sup>ʃ</sup> a:jiḡaw	. <sup>ʃ</sup> a:jagt	. <sup>ʃ</sup> a:jagtaj
. <sup>ʃ</sup> a:jagtaw	. <sup>ʃ</sup> a:jagt	. <sup>ʃ</sup> a:jagna	. j <sup>ʃ</sup> a:jiḡ
. t <sup>ʃ</sup> a:jiḡ	. j <sup>ʃ</sup> a:jgu:n	. t <sup>ʃ</sup> a:jiḡ	. t <sup>ʃ</sup> a:jiḡi:n
. t <sup>ʃ</sup> a:jgu:n	. ʔa <sup>ʃ</sup> a:jiḡ	. n <sup>ʃ</sup> a:jiḡ	. <sup>ʃ</sup> a:jiḡ
. <sup>ʃ</sup> a:jgaj	. <sup>ʃ</sup> a:jgaw	. m <sup>ʃ</sup> a:jiḡ	. m <sup>ʃ</sup> a:jga
. m <sup>ʃ</sup> a:jiḡi:n	. m <sup>ʃ</sup> a:jiḡa	.	.
.			
. <sup>ʃ</sup> əḥak	‘to laugh’		

. ḏ <sup>h</sup> ikat	. ḏ <sup>h</sup> ikaw	. ḏ <sup>h</sup> akt	. ḏ <sup>h</sup> aktaj
. ḏ <sup>h</sup> aktaw	. ḏ <sup>h</sup> akt	. ḏ <sup>h</sup> akna	. jəḏ <sup>h</sup> ak
. təḏ <sup>h</sup> ak	. jəḏ <sup>h</sup> iku:n	. təḏ <sup>h</sup> ak	. təḏ <sup>h</sup> iki:n
. təḏ <sup>h</sup> iku:n	. ʔaḏ <sup>h</sup> ak	. nəḏ <sup>h</sup> ak	. ḏ <sup>h</sup> ak
. ḏ <sup>h</sup> ikaj	. ḏ <sup>h</sup> ikaw	. ḏ <sup>h</sup> a:ḥik	. ḏ <sup>h</sup> a:ḥka
. ḏ <sup>h</sup> a:ḥki:n	. ḏ <sup>h</sup> əḥk/ḏ <sup>h</sup> əḥik	.	.
.			

/ʕ/

. ʕati:dʒ °	‘old, ragged’
. ʕati:dʒa °	(f)
. ʕittadʒ/ʕta:dʒ	(pl.)
. ʕati:g °	‘old, ragged’
. ʕati:ga °	(f)
. ʕittag/ʕta:g	(pl.)
. ʕadʒa:jib	‘wonders’
. ʕadʒi:b	‘wonderous’
. ʕadʒi:ba	(f.)
. ʕadʒi:bi:n	(pl.)
. ʕadʒi:ba	(pl. non-human)
. ʕadʒdʒ	‘a dusty wind’
. ʕadʒma:n◇	‘one of the emirates of the UAE’
. ʕatʃfa	‘braid’
. ʕatʃfite:n	(dual)
. ʕatʃa:jif/ʕatʃfa:t	(pl.)
. ʕarag	‘sweat’
. ʕaraj	‘lame’
. ʕarja	(f.)
. ʕirja:n	(pl.)
. ʕafi:g	‘lover’
. ʕafi:ge:n	(dual)
. ʕiʃʃa:g	(pl.)
. ʕafi:ga	(f.)
. ʕafi:gte:n	(dual f.)
. ʕafi:ga:t	(pl. f.)
. ʕas <sup>ʕ</sup> gu:l <sup>ʕ</sup> a	‘skinny’
. ʕas <sup>ʕ</sup> gu:l <sup>ʕ</sup> a	(f.)

. ʎas <sup>ʰ</sup> a:ɡəl <sup>ʰ</sup>	(pl.)
. ʎagəl <sup>ʰ</sup>	‘mind’
. ʎagl <sup>ʰ</sup> ε:n	(dual)
. ʎgu:l <sup>ʰ</sup>	(pl.)
. ʎagrab	‘scorpion’
. ʎagrabε:n	(dual)
. ʎaga:rib	(pl.)
. ʎankabu:t	‘spider’
. ʎankabu:te:n	(dual)
. ʎana:kib	(pl.)
. ʎawaj	‘bent’
. ʎo:ja	(f.)
. ʎu:ja:n	(pl.)
. ʎajal	‘then, therefore’
. ʎaju:z	‘old woman’
. ʎaja:jiz	(pl.)
. ʎa:ɡəl <sup>ʰ</sup>	‘wise, sensible’
. ʎa:ɡəl <sup>ʰ</sup> /ʎa:ɡl <sup>ʰ</sup> a	(f.)
. ʎiggal <sup>ʰ</sup>	(pl.)
. ʎidʒl/ʎidʒil◊	‘calf of cow’
. ʎidʒle:n/ʎi:le:n	(dual)
. ʎijile:n	(dual)
. ʎdʒu:l◊	(pl.)
. ʎirdʒ	‘vein’
. ʎirdʒe:n	(dual)
. ʎru:dʒ	(pl.)
. ʎirg	‘vein’
. ʎirge:n	(dual)
. ʎru:g	(pl.)
. ʎiʃridʒ	‘camomile’
. ʎigd/ʎigid	‘necklace’
. ʎigde:n	(dual)
. ʎgu:d	(pl.)
. ʎila:dʒ	‘treatment’
. ʎinge:ʃ	‘fruit seed’
. ʎinge:ʃa	(singular)
. ʎinge:ʃte:n	(dual)

. ʕila:dʒ	‘treatment’		
. ʕiltʃ	‘chewing gum’		
. ʕiltʃe:n	(dual)		
. ʕlu:tʃ	(pl.)		
. ʕdʒimi:◊	‘a Persian descendant’		
. ʕdʒimi:ja◊	(dual)		
. ʕadʒam◊	(pl.)		
. ʕga:l <sup>ʕ</sup>	‘a head band for men’		
. ʕga:l <sup>ʕ</sup> ε:n	(dual)		
. ʕigəl <sup>ʕ</sup>	(pl.)		
. ʕja:l	‘kids’		
. ʕjila	‘rushing’		
. ʕatʃtʃaf	‘to make braids’		
. ʕatʃtʃifat	. ʕatʃtʃifaw	. ʕatʃtʃaft	. ʕatʃtʃaftaj
. ʕatʃtʃaftaw	. ʕatʃtʃaft	. ʕatʃtʃafna	. jʕatʃtʃif
. tʕatʃtʃif	. jʕatʃfu:n	. tʕatʃtʃif	. tʕatʃfi:n
. tʕatʃfu:n	. ʔaʕatʃtʃif	. nʕatʃtʃif	. ʕatʃtʃif
. ʕatʃfaj	. ʕatʃfaw	. mʕatʃtʃif	. mʕatʃfa
. mʕatʃfi:n	. taʕtʃi:f	. mʕatʃtʃaf	. mʕatʃtʃifa
. mʕatʃtʃafi:n			
. ʕakkaf	‘to bend repeatedly (causative)’		
. ʕakkifat	. ʕakkifaw	. ʕakkaft	. ʕakkaftaj
. ʕakkaftaw	. ʕakkaft	. ʕakkafna	. jʕakkif
. tʕakkif	. jʕakfu:n	. tʕakkif	. tʕakfi:n
. tʕakfu:n	. ʔaʕakkif	. nʕakkif	. ʕakkif
. ʕakfaj	. ʕakfaw	. mʕakkif	. mʕakfa
. mʕakfi:n	. taʕaki:f	. mʕakkaf	. mʕakkifa
. mʕakkafi:n			
. ʕallatʃ	‘to chew’		
. ʕallitʃat	. ʕallitʃaw	. ʕallatʃt	. ʕallatʃtaj
. ʕallatʃtaw	. ʕallatʃt	. ʕallatʃna	. jʕallitʃ
. tʕallitʃ	. jʕaltʃu:n	. tʕallitʃ	. tʕaltʃi:n
. tʕaltʃu:n	. ʔaʕallitʃ	. nʕallitʃ	. ʕallitʃ
. ʕaltʃaj	. ʕaltʃaw	. mʕallitʃ	. mʕaltʃa
. mʕaltʃi:n	.	. mʕallatʃ	.
.			

. ʕallag	‘to hang’		
. ʕalligat	. ʕalligaw	. ʕallagt	. ʕallagtaj
. ʕallagtaw	. ʕallagt	. ʕallagna	. jʕallig
. tʕallig	. jʕalgu:n	. tʕallig	. tʕalgi:n
. tʕalgu:n	. ʔaʕallig	. nʕallig	. ʕallig
. ʕalgaj	. ʕalgaw	. mʕallig	. mʕalga
. mʕalgi:n	. taʕli:g	. mʕallag	. mʕalliga
. mʕallagi:n			
. ʕawwa	‘to bend’		
. ʕawwat	. ʕawwaaw	. ʕawwe:t	. ʕawwe:taj
. ʕawwe:taw	. ʕawwe:t	. ʕawwe:na	. jʕawwi:
. tʕawwi:	. jʕawwu:n	. tʕawwi:	. tʕawwi:n
. tʕawwu:n	. ʔaʕawwi:	. nʕawwi:	. ʕaww(i)
. ʕawwaj	. ʕawwaw	. mʕawwi:	. mʕawja
. mʕawwi:n <sup>9</sup>	.	. mʕawwaj	. mʕawwija
. mʕawwaji:n			
. ʕɑ:g	‘to impede’		
. ʕɑ:gat	. ʕɑ:gaw	. ʕigt	. ʕigtaj
. ʕigtaw	. ʕigt	. ʕigna	. jʕu:g
. tʕu:g	. jʕu:gu:n	. tʕu:g	. tʕu:gi:n
. tʕu:gu:n	. ʔaʕu:g	. nʕu:g	. ʕu:g
. ʕu:gaj	. ʕu:gaw	. ʕɑ:jig	. ʕɑ:jga
. ʕɑ:jgi:n	.	.	.
.			
. ʕɑ:ladʒ	‘to treat’		
. ʕɑ:lidʒat	. ʕɑ:lidʒaw	. ʕɑ:ladʒt	. ʕɑ:ladʒtaj
. ʕɑ:ladʒtaw	. ʕɑ:ladʒt	. ʕɑ:ladʒna	. jʕɑ:lidʒ
. tʕɑ:lidʒ	. jʕɑ:lidʒu:n	. tʕɑ:lidʒ	. tʕɑ:ldʒi:n
. jʕɑ:ldʒu:n	. ʔaʕɑ:lidʒ	. nʕɑ:lidʒ	. ʕɑ:lidʒ
. ʕɑ:ldʒaj	. ʕɑ:ldʒaw	. mʕɑ:lidʒ	. mʕɑ:ldʒa
. mʕɑ:ldʒi:n	. ʕila:dʒ/mʕɑ:ldʒa	.	.
.			
. ʕitadʒ	‘to wear’		
. ʕtidʒat	. ʕtidʒaw	. ʕitadʒt	. ʕitadʒtaj
. ʕitadʒtaw	. ʕitadʒt	. ʕitadʒna	. jiʕitadʒ

<sup>9</sup> Also [mʕawji:n]. This verb is etymologically derived from [ʕawwadʒ].

. tiṣṭadʒ	. jiṣṭidʒu:n	. tiṣṭadʒ	. tiṣṭidʒe:n
. tiṣṭidʒu:n	. ʔaṣṭadʒ	. niṣṭadʒ	. ṣṭadʒ
. ṣṭidʒaj	. ṣṭidʒaw	.	.
.	. ṣṭidʒ/ṣṭidʒ	.	.
. ṣṭag	‘to wear’		
. ṣṭigat	. ṣṭigaw	. ṣṭagt	. ṣṭagtaj
. ṣṭagtaw	. ṣṭagt	. ṣṭagna	. jiṣṭiag
. tiṣṭag	. jiṣṭigu:n	. tiṣṭag	. tiṣṭigi:n
. tiṣṭigo:n	. ʔaṣṭag	. niṣṭag	. ṣṭag
. ṣṭigaj	. ṣṭigaw	.	.
.	. ṣṭig/ṣṭig	.	.
.			
. ṣṭab	‘to please’		
. ṣṭabat/ṣṭibat	. ṣṭabaw/ṣṭibaw	. ṣṭabt	. ṣṭabtaj
. ṣṭabtaw	. ṣṭabt	. ṣṭabna	. jaṣṭib
. taṣṭib	. jiṣṭibu:n	. taṣṭib	. tiṣṭibi:n
. taṣṭibu:n	. ʔaṣṭib	. niṣṭib	. ṣṭib
. ṣṭibaj	. ṣṭibaw	. ṣa:ṣṭib	. ṣa:ṣṭba
. ṣa:ṣṭibi:n	. ṣṭab	.	.
.			
. ṣṭag	‘to adore’		
. ṣṭigat	. ṣṭigaw	. ṣṭagt	. ṣṭagtaj
. ṣṭagtaw	. ṣṭagt	. ṣṭagna	. jiṣṭag
. tiṣṭag	. jiṣṭigu:n	. tiṣṭag	. tiṣṭigi:n
. tiṣṭigu:n	. ʔaṣṭig	. niṣṭig	. ṣṭig
. ṣṭigaj	. ṣṭigaw	. ṣa:ṣṭig	. ṣa:ṣṭga
. ṣa:ṣṭi:n	. ṣṭig/ṣṭig	. maṣṭu:g	. maṣṭu:ga
. maṣṭu:gi:n			
. ṣṭaz	‘to be incapable’		
. ṣṭizat	. ṣṭizaw	. ṣṭizt	. ṣṭiztaj
. ṣṭiztaw	. ṣṭizt	. ṣṭizna	. jiṣṭaz
. tiṣṭaz	. jiṣṭizu:n	. tiṣṭaz	. tiṣṭizi:n
. tiṣṭizu:n	. ʔaṣṭaz	. niṣṭaz	. ṣṭaz
. ṣṭizaj	. ṣṭizaw	.	.
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/ᄃ/

. ᄃabga	‘a night snack’		
. ᄃarga:n	‘drowned’		
. ᄃarga:na	(f.)		
. ᄃarga:ni:n	(pl.)		
. ᄃaldʒ	‘incomprehensible’		
. ᄃaldʒa	(f.)		
. ᄃaldʒi:n	(pl.)		
. ᄃantʃa	‘an oval-shaped dish’		
. ᄃantʃite:n	(dual)		
. ᄃna:tʃ	(pl.)		
. ᄃa:midʒ °	‘dark’		
. ᄃa:mdʒa	(f.)		
. ᄃimmadʒ	(pl.)		
. ᄃawa:midʒ °	(pl.)		
. ᄃa:mig °	‘dark’		
. ᄃa:mga	(f.)		
. ᄃimmag/ᄃawa:mig °	(pl.)		
. ᄃilfidʒ	‘low class people’		
. ᄃilga	‘narrowness’		
. ᄃarrag	‘to drawn, flood (transitive)’		
. ᄃarrigat	. ᄃarrigaw	. ᄃarragt	. ᄃarragtaj
. ᄃarragtaw	. ᄃarragt	. ᄃarragtna	. ᄃarrig
. ᄃarrig	. ᄃarigu:n	. ᄃarrig	. ᄃargi:n
. ᄃargu:n	. ᄃarrig	. ᄃarrig	. ᄃarrig
. ᄃargaj	. ᄃargaw	. ᄃarrig	. ᄃarga
. ᄃargi:n	. ᄃargi:g	. ᄃarrag	. ᄃarriga
. ᄃarragi:n			
. ᄃammadʒ	‘to darken (transitive)’		
. ᄃammidʒat	. ᄃammidʒaw	. ᄃammadʒt	. ᄃammadʒtaj
. ᄃammadʒtaw	. ᄃammadʒt	. ᄃammadʒna	. ᄃammadʒ
. ᄃammidʒ	. ᄃamidʒu:n	. ᄃammidʒ	. ᄃamdʒi:n
. ᄃamdʒu:n	. ᄃammadʒ	. ᄃammidʒ	. ᄃammidʒ
. ᄃamdʒaj	. ᄃamdʒaw	. ᄃammadʒ	. ᄃamdʒa
. ᄃammadʒi:n	. ᄃammi:dʒ	. ᄃammadʒ	. ᄃammadʒa
. ᄃammadʒi:n			
. ᄃammag	‘to darken (transitive)’		



. ƙammigat	. ƙammigaw	. ƙammagt	. ƙammagtaj
. ƙammagtaw	. ƙammagt	. ƙammagna	. jƙammig
. tƙammig	. jƙamigu:n	. tƙammig	. tƙamgi:n
. tƙamgu:n	. ?aƙammig	. nƙammig	. ƙammig
. ƙamgaj	. ƙamgaw	. mƙammig	. mƙamga
. mƙamgi:n	. taƙmi:g	. mƙammag	. mƙammiga
. mƙammagi:n			
. ƙirag	‘to drawn, sink’		
. ƙrigat	. ƙrigaw	. ƙiragt	. ƙiragtaj
. ƙiragtaw	. ƙiragt	. ƙiragna	. jirag
. tirag	. jirigu:n	. tirag	. tirigi:n
. tirigu:n	. ?aƙrag	. nirag	. ƙrag
. ƙirgaj	. ƙirgaw	. ƙa:rig	. ƙa:rga
. ƙa:rgi:n	. ƙarag	.	.
.			
. ƙimadɓ	‘to darken’		
. ƙmidɓat	. ƙmidɓaw	. ƙimadɓt	. ƙimadɓtaj
. ƙimadɓtaw	. ƙimadɓt	. ƙimadɓna	. jiradɓ
. tiradɓ	. jiradɓu:n	. tiradɓ	. tiradɓi:n
. tiradɓu:n	. ?aƙmadɓ	. niradɓ	. ƙmadɓ
. ƙmidɓaj	. ƙmidɓaw	.	.
.	.	.	.
.			
. ƙimag	‘to darken’		
. ƙmigat	. ƙmigaw	. ƙimagt	. ƙimagtaj
. ƙimagtaw	. ƙimagt	. ƙimagna	. jirimag
. tirimag	. jirimigu:n	. tirimag	. tirimagi:n
. tirimagu:n	. ?aƙmag	. nirimag	. ƙmag
. ƙmigaj	. ƙmigaw	.	.
.	.	.	.
.			
/f/			
. faradɓ◊	‘p.n. (m.)’		
. faradɓ	‘relief’		
. fatɬtɬa	‘gap, opening’		
. fatɬtsite:n	(dual)		
. fatɬtɬa:t	(pl.)		
. farg	‘difference’		

. farg	‘part of the hair’		
. farga	‘seperation’		
. fasgɑ:n	‘spoiled’		
. fasgɑ:na	(f.)		
. fasgɑ:ni:n	(pl.)		
. fagir	‘poverty’		
. fagiʃ	‘truffles’		
. fagʃa	(singular)		
. fagʃite:n	(dual)		
. fakka	‘releif’		
. fajir	‘dawn’		
. fa:lidʒ	‘paralysis’		
. fo:g	‘up, top’		
. fo:lak	‘spangles’		
. fo:lake:n	(dual)		
. fisag	‘vanity’		
. fiʃag	‘bullets’		
. fiʃiga	(singular)		
. fiʃigte:n	(dual)		
. fiʃiga:t	(pl.)		
. fikr/fikir	‘assumption, view’		
. finja:l	‘coffee cup’		
. finja:le:n	(dual)		
. fana:ji:l	(pl.)		
. fta:g	‘rupture’		
. fra:g	‘seperation’		
. fadʒdʒar	‘to explode (transitive)’		
. fadʒdʒirat	. fadʒdʒiraw	. fadʒdʒart	. fadʒdʒartaj
. fadʒdʒartaw	. fadʒdʒart	. fadʒdʒarna	. jfadʒdʒir
. tfadʒdʒir	. jfadʒru:n	. tfadʒdʒir	. tfadʒdʒri:n
. tfadʒru:n	. ʔafadʒdʒir	. nfadʒdʒir	. fadʒdʒir
. fadʒraj	. fadʒraw	. mfadʒdʒir	. mfadʒra
. mfadʒri:n	. tafdʒi:r	.	.
.			
. fatʃtʃ	‘to open’		
. fatʃtʃat	. fatʃtʃaw	. fatʃtʃe:t	. fatʃtʃe:taj
. fatʃtʃe:taw	. fatʃtʃe:t	. fatʃtʃe:na	. jfitʃtʃ
. tfitʃtʃ	. jfitʃtʃu:n	. tfitʃtʃ	. tfitʃtʃi:n

. tfitʃtʃu:n	. ʔafitʃtʃ	. nfitʃtʃ	. fitʃtʃ
. fitʃtʃaj	. fitʃtʃaw	. fa:tʃtʃ	. fa:tʃtʃa
. fa:tʃtʃi:n	. fatʃtʃ	.	.
.			
. farradʒ	‘to relief’		
. farridʒat	. farridʒaw	. farradʒt	. farradʒtaj
. farradʒtaw	. farradʒt	. farradʒna	. jfarridʒ
. tfarridʒ	. jfardʒu:n	. tfarridʒ	. tfardʒi:n
. tfardʒu:n	. ʔafarridʒ	. nfarridʒ	. farridʒ
. fardʒaj	. fardʒaw	. mfarridʒ	. mfardʒa
. mfardʒi:n	. tafri:dʒ	.	.
.			
. farrag	‘to cause to separate, differentiate’		
. farrigat	. farrigaw	. farragt	. farragtaj
. farragtaw	. farragt	. farragna	. jfarrig
. tfarrig	. jfargu:n	. tfargu:n	. tfargi:n
. tfargu:n	. ʔafarrig	. nfarrig	. farrig
. fargaj	. fargaw	. mfarrig	. mfarga
. mfargi:n	. tafri:g	. mfarrag	. mfarriga
. mfarragi:n			
.			
. fakkar	‘to think’		
. fakkirat	. fakkiraw	. fakkart	. fakkartaj
. fakkartaw	. fakkart	. fakkarna	. jfakkir
. tfakkir	. jfakru:n	. tfakkir	. tfakri:n
. tfakru:n	. ʔafakkir	. nfakkir	. fakkir
. fakraj	. fakraw	. mfakkir	. mfakra
. mfakri:n	. tafki:r	.	.
.			
. fangaʃ	‘to die’		
. fangiʃat	. fangiʃaw	. fangaʃt	. fangaʃtaj
. fangaʃtaw	. fangaʃt	. fangaʃna	. jfangiʃ
. tfangiʃ	. jfangiʃu:n	. tfangiʃ	. tfangiʃi:n
. tfangiʃu:n	. ʔafangiʃ	. nfangiʃ	. fangiʃ
. fangiʃaj	. fangiʃaw	. mfangiʃ	. mfangiʃa
. mfangiʃi:n	. fangiʃa	.	.
.			
. fa:tʃatʃ	‘to disassemble’		
. fa:tʃitʃat	. fa:tʃitʃaw	. fa:tʃatʃt	. fa:tʃatʃtaj

. fa:tʃatʃtaw	. jfa:tʃitʃu:n	. tfa:tʃitʃ	. tfa:tʃitʃi:n
. tfa:tʃitʃu:n	. jfa:tʃitʃu:n	. tfa:tʃitʃ	. tfa:tʃitʃi:n
. tfa:tʃitʃu:n	. ʔafa:tʃitʃ	. nfa:tʃitʃ	. fa:tʃitʃ
. fa:tʃitʃaj	. fa:tʃitʃaw	. mfa:tʃitʃ	. mfa:tʃitʃa
. mfa:tʃitʃi:n	. mfa:tʃatʃ	.	.
.			
. fa:radʒ	‘to leave’		
. fa:ridʒt	. fa:ridʒaw	. fa:radʒt	. fa:radʒtaj
. fa:radʒtaw	. fa:radʒt	. fa:radʒna	. jfa:ridʒ
. tfa:ridʒ	. jfa:rdʒu:n	. tfa:ridʒ	. tfa:rdʒi:n
. tfa:rdʒu:n	. ʔafa:ridʒ	. nfa:ridʒ	. fa:ridʒ
. fa:rdʒaj	. fa:rdʒaw	. mfa:ridʒ	. mfa:rdʒa
. mfa:rdʒi:n	. mfa:ridʒa	.	.
.			
. fa:rag	‘to leave’		
. fa:rigt	. fa:rigaw	. fa:ragt	. fa:ragtaj
. fa:ragtaw	. fa:rag	. fa:ragna	. jfa:rig
. tfa:rig	. jfa:rgu:n	. tfa:rig	. tfa:rgi:n
. tfa:rgu:n	. ʔafa:rig	. nfa:rig	. fa:rig
. fa:rgaj	. fa:rgaw	. mfa:rig	. mfa:rga
. mfa:rgi:n	. mfa:riga	.	.
.			
. fitag	‘unstitch’		
. ftigat	. ftigaw	. fitagt	. fitagtaj
. fitagtaw	. fitagt	. fitagna	. jiftig
. niftig	. jiftigu:n	. tiftig	. tiftigi:n
. tiftigu:n	. ʔaftig	. niftig	. ftig
. fitgaj	. fitgaw	. fa:tig	. fa:tga
. fa:tgi:n	. fatg	. maftu:g	. maftu:ga
. maftu:gi:n			
.			
. firag	‘to be different’		
. frigat	. frigaw	. firagt	. firagtaj
. firagtaw	. firagt	. firagna	. jifrig
. tifrig	. jifrigu:n	. tifrig	. tifrigi:n
. tafrigu:n	. ʔafrig	. nifrig	. frig
. frigaj	. frigaw	. fa:rig	. fa:rga
. fa:rgi:n	. farg	.	.

. firak	‘to rub’		
. frikat	. frikaw	. firakt	. firaktaj
. firaktaw	. firakt	. firakna	. jifrik
. tifik	. jifriku:n	. tifik	. tifikri:n
. tifikri:n	. ?afrik	. nifik	. frik
. frikaj	. frikaw	. fa:rik	. fa:rka
. fa:rki:n	. fark	.	.
. fihag	‘to open (e.g. an oyster)’		
. fhigat	. fhigaw	. fihagt	. fihagtaj
. fihagtaw	. fihagt	. fihagna	. jifhag
. tifhag	. jifhigu:n	. tifhag	. tifhigi:n
. tifhigu:n	. ?afhag	. nifhag	. fhag
. fhigaj	. fhigaw	. fa:hig	. fa:hga
. fa:hgi:n	. fahg	.	.
. ftakk	‘to be relieved’		
. ftakkat	. ftakkaw	. ftakke:t	. ftakke:taj
. ftakke:taw	. ftakke:t	. ftakke:na	. jiftakk
. tiftakk	. jiftakko:n	. tiftakk	. tiftakke:n
. tiftakko:n	. ?aftakk	. niftakk	. ftakk
. ftakkaj	. ftakkaw	. miftakk	. miftakka
. miftakki:n	. fakka	.	.
. ftirag	‘to get separated’		
. ftargat	. ftargaw	. ftiragt	. ftiragtaj
. ftiragtaw	. ftiragt	. ftiragna	. jiftirg
. tiftirig	. jiftargo:n	. tiftirig	. tiftarge:n
. tiftargo:n	. ?aftirig	. niftirig	. ftirig
. ftargaj	. ftargaw	. miftirig	. miftarga
. miftargi:n	. ftira:g	.	.
. ftigar	‘to be poor’		
. ftagrat	. ftagraw	. ftigart	. ftigartaj
. ftigartaw	. ftigart	. ftigartna	. jiftigir
. tiftigir	. jiftagro:n	. tiftigir	. tiftagre:n
. tiftagro:n	. ?aftigir	. niftigir	. ftigir
. ftagraj	. ftagraw	. miftigir	. miftagra

. miftagri:n	.	.	.
/g/			
. gabəɫ <sup>ɪ</sup>			‘before’
. gaḥat <sup>ɪ</sup>			‘drought’
. gaḥba			‘prostitute’
. gḥa:b			(pl.)
. gaḥfi:ja			‘cap, hat’
. gaḥfi:te:n			(dual)
. giḥa:fi:			(pl.)
. gadd			‘as much’
. gadr/gadir			‘value’
. garanbaɫ			‘in a bad shape (usually a car)’
. gara:da			‘bad luck’
. gara:gir			‘testis’
. garḥ			‘sore, canker’
. garga			‘chattering’
. gargara			‘chattering’
. gargu:r			‘a cage for traping fish’
. gargu:re:n			(dual)
. gara:gi:r			(pl.)
. garma			‘a bite’
. garmite:n			(dual)
. garn			‘animal horn’
. garne:n			(dual)
. gru:n			(pl.)
. gaɟɟ			‘baggage’
. gas <sup>ɪ</sup> ari:ja			‘potty’
. gas <sup>ɪ</sup> ari:te:n			(dual)
. gas <sup>ɪ</sup> ari:ja:t			(pl.)
. gas <sup>ɪ</sup> ər			‘palace’
. gas <sup>ɪ</sup> re:n			(dual)
. gs <sup>ɪ</sup> u:r			(pl.)
. gas <sup>ɪ</sup> s <sup>ɪ</sup> a:b			‘butcher’
. gas <sup>ɪ</sup> s <sup>ɪ</sup> a:be:n			(dual)
. gəs <sup>ɪ</sup> a:s <sup>ɪ</sup> i:b			(pl.)
. gas <sup>ɪ</sup> s <sup>ɪ</sup> a:bi:n			(pl.)

. gat <sup>ɿ</sup> u:	‘cat’
. gat <sup>ɿ</sup> wa	(f.)
. gat <sup>ɿ</sup> wite:n	(dual)
. gt <sup>ɿ</sup> a:wa	(pl.)
. ga <sup>ɿ</sup> da	‘(a) sitting, a way of sitting’
. gað <sup>ɿ</sup> ð <sup>ɿ</sup>	‘hole, pierce’
. gað <sup>ɿ</sup> ð <sup>ɿ</sup> ε:n	(dual)
. gð <sup>ɿ</sup> u:ð <sup>ɿ</sup>	(pl.)
. gaf <sup>ɿ</sup> ʃa	‘spoon’
. gaf <sup>ɿ</sup> ʃite:n	(dual)
. gfa:ʃ	(pl.)
. galan	‘bucket’
. galane:n	(dual)
. gla:na	(pl.)
. gal <sup>ɿ</sup> am	‘pen’
. gal <sup>ɿ</sup> ame:n	(dual)
. gl <sup>ɿ</sup> a:ma	(pl.)
. gal <sup>ɿ</sup> b	‘heart’
. gal <sup>ɿ</sup> bε:n	(dual)
. gl <sup>ɿ</sup> u:b	(pl.)
. gal <sup>ɿ</sup> ba	‘a turn, switch’
. gal <sup>ɿ</sup> l <sup>ɿ</sup> a:bi:	‘a kind of pigeons’
. gal <sup>ɿ</sup> t <sup>ɿ</sup> a	‘a sitting’
. gaməl <sup>ɿ</sup>	‘lice’
. gaml <sup>ɿ</sup> a	(singular)
. gaml <sup>ɿ</sup> εte:n	(dual)
. gaml <sup>ɿ</sup> a:t	(pl.)
. ganas <sup>ɿ</sup>	‘hunting’
. ganna:s <sup>ɿ</sup>	‘hunter’
. gahab	‘wind-eroded hill’
. gahabe:n	(dual)
. gha:b	(pl.)
. gahwa	‘coffee’
. gawwa:d	‘pimp’
. giwa:wi:d	(pl.)
. ga:s <sup>ɿ</sup> ər	‘lacking’
. ga:si:	‘cruel’

. ga:sja	(f.)
. ga:sji:n	(pl.)
. ga:ri:	‘stroller’
. ga:ri:je:n	(dual)
. giwa:ri:	(pl.)
. ga:f	‘bottom’
. ga:ma	‘giant’
. l-ga:jla	‘midday’
. gubgub	‘crab’
. gubgube:n	(dual)
. giba:gib	(pl.)
. gumar	‘moon’
. guwwa	‘strength’
. l-guwwa	‘a greeting word’
. gu:t <sup>f</sup> i:	‘can’
. gu:t <sup>f</sup> i:je:n	(dual)
. giwa:t <sup>f</sup> i:	(pl.)
. go:dʒ	‘plums’
. go:dʒa	(singular)
. go:l <sup>f</sup>	‘opinion’
. go:l <sup>f</sup> at-	‘(the) saying of’
. gibi:la	‘tribe’
. gibi:lte:n	(dual)
. giba:jil/giba:jil	(pl.)
. giħhi:	‘stingy’
. giħhi:ja	(f.)
. ġhu:ħ	(pl.)
. gidu:	‘huble bubble’
. gidu:f	‘food’
. gidla <sup>10</sup>	‘bangs’
. gidlite:n	(dual)
. gdal	(pl.)
. gidda:m	‘in front of’
. giringafo:	‘a traditional event similar to halloween’
. giri:b/dʒiri:b	‘close by’

<sup>10</sup> This form may also surface as [giðla], in which affrication is blocked by OO-correspondence.



. giri:ba/dʒiri:ba	(f.)
. gr:ab	(pl.)
. girb	‘closeness’
. gərs <sup>ʕ</sup>	‘pill, loaf’
. girs <sup>ʕ</sup> ɛ:n	(dual)
. ʔagra:s <sup>ʕ</sup>	(pl.)
. girt <sup>ʕ</sup> a:s	‘paper’
. girt <sup>ʕ</sup> a:se:n	(dual)
. gara:t <sup>ʕ</sup> i:s	(pl.)
. girga:ʃa	‘toy’
. girgifa:n	‘a kind of fish’
. gisma	‘predestinated fate’
. giʃba:r	‘wood chips’
. giʃir	‘peels’
. giʃra	(singular)
. giʃu:r	(pl.)
. gəs <sup>ʕ</sup> i:d	‘poetry’
. gəs <sup>ʕ</sup> i:da	(singular)
. gəs <sup>ʕ</sup> a:ʃid	(pl.)
. gət <sup>ʕ</sup> ən	‘cotton’
. gət <sup>ʕ</sup> i:ʃa	‘a curse word’
. gət <sup>ʕ</sup> i:ʃa	‘rupture of relation’
. gət <sup>ʕ</sup> ʃa	‘a piece’
. gət <sup>ʕ</sup> ʃite:n	(dual)
. gt <sup>ʕ</sup> aʃ	(pl.)
. gət <sup>ʕ</sup> i:f	‘a city in Saudi Arabia’
. gifas <sup>ʕ</sup>	‘cage’
. gifas <sup>ʕ</sup> ɛ:n	(dual)
. gfa:s <sup>ʕ</sup>	(pl.)
. gifəl <sup>ʕ</sup>	‘lock’
. gifl <sup>ʕ</sup> ɛ:n	(dual)
. gfa:l <sup>ʕ</sup>	(pl.)
. gili:l/dʒili:l	‘little amount, lacking’
. gili:la/dʒili:la	(f.)
. gla:l	(pl.)
. gili:li:n/dʒili:li:n	(pl.)
. giwi:	‘strong’

. giwi:ja	(f.)		
. gwa:ja	(pl.)		
. gi:ma/dzi:ma	‘price’		
. ge:h	‘pus’		
. ge:s	‘hipscotch’		
. ge:ð <sup>f</sup>	‘summer heat’		
. gra:b	‘gun case’		
. gra:be:n	(dual)		
. gra:ba:t	(pl.)		
. gʃa:r	‘personal belongings, grocery supplies’		
. gs <sup>f</sup> u:r	‘missing, lacking’		
. gt <sup>f</sup> ε:w	‘kitten’		
. gma:f	‘pearls’		
. gna:d	‘cardamon’		
. gja:s	‘size’		
. gaddam	‘to advance (transitive)’		
. gaddimat	. gaddimaw	. gaddamt	. gaddamtaj
. gaddamtaw	. gaddamt	. gaddamna	. jgaddim
. tgaddim	. jgadmu:n	. tgaddim	. tgadmi:n
. tgadmu:n	. ?agaddim	. ngaddim	. gaddim
. gadmaj	. gadmaw	. mgaddim	. mgadma
. mgadmi:n	. tagdi:m	. mgaddam	. mgaddima
.			
. gara	‘to read’		
. garat	. garaw	. gare:t	. gare:taj
. gare:taw	. gare:t	. gare:na	. jigra
. tigra	. jigro:n	. tigra	. tigre:n
. tigro:n	. ?agra	. nigra	. gra
. graj	. graw	. ga:ri:	. ga:rja
. ga:rji:n	. gira:ja	. magri: (ʃale:h)	. magri: (ʃale:ha)
.			
. magri: (ʃale:hum)			
. garad	‘to bring bad luck’		
. gridat	. gridaw	. garadt	. garadtaj
. garadtaw	. garadt	. garadna	. jagrid
. tagrid	. jagridu:n	. tagrid	. tagridi:n
. tagridu:n	. ?agrid	. nagrid	. grid

. gridaj	. gridaw	. gɑ:rid	. gɑ:rda
. gɑ:rdi:n	. gara:da	. magru:d	. magru:da
. magru:di:n			
. gardan	‘to persuade’		
. gardinat	. gardinaw	. gardant	. gardantaj
. gardantaw	. gardant	. gardanna	. jgardin
. tgardin	. jgardinu:n	. tgardin	. tgardini:n
. tgardinu:n	. ?agardin	. ngardin	. gardin
. gardinaj	. gardinaw	. mgardin	. mgardina
. mgardini:n	. gardina	.	.
.			
. gargaŋ	‘to celebrate [giringaŋo:]’		
. gargiŋat	. gargiŋaw	. gargaŋt	. gargaŋtaj
. gargaŋtaw	. gargaŋt	. gargaŋna	. jgargiŋ
. tgargiŋ	. jgargiŋu:n	. tgargiŋ	. tgargiŋi:n
. tgargiŋu:n	. ?agargiŋ	. ngargiŋ	. gargiŋ
. gargiŋaj	. gargiŋaw	. mgargiŋ	. mgargiŋa
. mgargiŋi:n	. gargiŋa	.	.
.			
. garr	‘to settle down’		
. garrat	. garraw	. garre:t	. garre:taj
. garre:taw	. garre:t	. garre:na	. jgirr
. tgirr	. jgirru:n	. tgirr	. tgirri:n
. tgirru:n	. ?agirr	. ngirr	. girr
. girraj	. girraw	. gɑ:rr	. gɑ:rra
. gɑ:rrin	. garr	.	.
.			
. garra	‘to cause to read’		
. garrat	. garraw	. garre:t	. garre:taj
. garre:taw	. garre:t	. garre:na	. jgarri:
. tgarri:	. jgarru:n	. tgarri:	. tgarri:n
. tgarru:n	. ?agarri:	. ngarri:	. garr(i)
. garraj	. garraw	. mgarri:	. mgarja
. mgarri:n/mgarji:n	.	.	.
.			
. garrab	‘to be close’		
. garribat	. garribaw	. garrabt	. garrabtaj
. garrabtaw	. garrabt	. garrabna	. jgarrib

. tgarrib	. jgarbu:n	. tgarrib	. tgarbi:n
. tgarbu:n	. ?agarrib	. ngarrib	. garrib
. garbaj	. garbaw	. mgarrib	. mgarba
. mgarbi:n	.	. mgarrab	. mgarriba
. mgarrabi:n			
. garraʕ	‘to become bold’		
. garriʕat	. garriʕaw	. garraʕt	. garraʕtaj
. garraʕtaw	. garraʕt	. garraʕna	. jgarriʕ
. tgarriʕ	. jgarʕu:n	. tgarriʕ	. tgarʕi:n
. tgarʕu:n	. ?agarriʕ	. ngarriʕ	. garriʕ
. garʕaj	. garʕaw	. mgarriʕ	. mgarʕa
. mgarʕi:n	. tagriʕ	. mgarraʕ	. mgarriʕa
. mgarraʕi:n			
. gargar	‘to chatter’		
. gargirat	. gargiraw	. gargart	. gargartaj
. gargartaw	. gargart	. gargarna	. jgargir
. tgargir	. jgargiru:n	. tgargir	. tgargiri:n
. tgargiru:n	. ?agargir	. ngargir	. gargir
. gargiraj	. gargiraw	. mgargir	. mgargira
. mgargiri:n	. gargira	.	.
.			
. gazz	‘to stare’		
. gazzat	. gazzaw	. gazzet	. gazzetaj
. gazzetaw	. gazzet	. gazzena	. jgizz
. tgizz	. jgizzu:n	. tgizz	. tgizzi:n
. tgizzu:n	. ?agizz	. ngizz	. gizz
. gizzaj	. gizzaw	.	.
.	. gazz	.	.
.			
. gazzar	‘to put up with’		
. gazzirat	. gazziraw	. gazzart	. gazzartaj
. gazzartaw	. gazzart	. gazzarna	. jgazzir
. tgazzir	. jgazru:n	. tgazzir	. tgazri:n
. tgazru:n	. ?agazzir	. ngazzir	. gazzir
. gazraj	. gazraw	. mgazzir	. mgazra
. mgazri:n	. tagzi:r	.	.
.			
. gassam	‘to divide and distribute’		

. gassimat	. gassimaw	. gassamt	. gassamtaj
. gassamtaw	. gassamt	. gassamna	. jgassim
. tgassim	. jgasmu:n	. tgassim	. tgasmi:n
. tgasmu:n	. ?agassim	. ngassim	. gassim
. gasmaj	. gasmaw	. mgassim	. mgasma
. mgasmi:n	. tagsi:m/gisma	. mgassam	. mgassima
. mgassimi:n			
. gaʃʃar	‘to peel’		
. gaʃʃirat	. gaʃʃiraw	. gaʃʃart	. gaʃʃartaj
. gaʃʃartaw	. gaʃʃart	. gaʃʃarna	. jgaʃʃir
. tgaʃʃir	. jgaʃru:n	. tgaʃʃir	. tgaʃri:n
. tgaʃru:n	. ?agaʃʃir	. ngaʃʃir	. gaʃʃir
. gaʃraj	. gaʃraw	. mgaʃʃir	. mgaʃra
. mgaʃri:n	. tagʃi:r	. mgaʃʃar	. mgaʃʃira
. mgaʃʃari:n			
. gas <sup>ʃ</sup> s <sup>ʃ</sup>	‘to cut’		
. gas <sup>ʃ</sup> s <sup>ʃ</sup> at	. gas <sup>ʃ</sup> s <sup>ʃ</sup> aw	. gas <sup>ʃ</sup> s <sup>ʃ</sup> ε:t	. gas <sup>ʃ</sup> s <sup>ʃ</sup> ε:taj
. gas <sup>ʃ</sup> s <sup>ʃ</sup> ε:taw	. gas <sup>ʃ</sup> s <sup>ʃ</sup> ε:t	. gas <sup>ʃ</sup> s <sup>ʃ</sup> ε:na	. jgəs <sup>ʃ</sup> s <sup>ʃ</sup>
. tgəs <sup>ʃ</sup> s <sup>ʃ</sup>	. jgəs <sup>ʃ</sup> s <sup>ʃ</sup> u:n	. tgəs <sup>ʃ</sup> s <sup>ʃ</sup>	. tgəs <sup>ʃ</sup> s <sup>ʃ</sup> i:n
. tgəs <sup>ʃ</sup> s <sup>ʃ</sup> u:n	. ?agəs <sup>ʃ</sup> s <sup>ʃ</sup>	. ngəs <sup>ʃ</sup> s <sup>ʃ</sup>	. gəs <sup>ʃ</sup> s <sup>ʃ</sup>
. gəs <sup>ʃ</sup> s <sup>ʃ</sup> aj	. gəs <sup>ʃ</sup> s <sup>ʃ</sup> aw	. ga:s <sup>ʃ</sup> s <sup>ʃ</sup>	. ga:s <sup>ʃ</sup> s <sup>ʃ</sup> a
. ga:s <sup>ʃ</sup> s <sup>ʃ</sup> i:n	. gas <sup>ʃ</sup> s <sup>ʃ</sup>	. mags <sup>ʃ</sup> u:s <sup>ʃ</sup>	. mags <sup>ʃ</sup> u:s <sup>ʃ</sup> a
. mags <sup>ʃ</sup> u:s <sup>ʃ</sup> i:n			
. gas <sup>ʃ</sup> s <sup>ʃ</sup> ar	‘to shorten’		
. gas <sup>ʃ</sup> s <sup>ʃ</sup> erat	. gas <sup>ʃ</sup> s <sup>ʃ</sup> eraw	. gas <sup>ʃ</sup> s <sup>ʃ</sup> art	. gas <sup>ʃ</sup> s <sup>ʃ</sup> artaj
. gas <sup>ʃ</sup> s <sup>ʃ</sup> artaw	. gas <sup>ʃ</sup> s <sup>ʃ</sup> art	. gas <sup>ʃ</sup> s <sup>ʃ</sup> arna	. jgas <sup>ʃ</sup> s <sup>ʃ</sup> er
. tgas <sup>ʃ</sup> s <sup>ʃ</sup> er	. jgasru:n	. tgas <sup>ʃ</sup> s <sup>ʃ</sup> er	. tgas <sup>ʃ</sup> ri:n
. tgas <sup>ʃ</sup> ru:n	. ?agas <sup>ʃ</sup> s <sup>ʃ</sup> er	. ngas <sup>ʃ</sup> s <sup>ʃ</sup> er	. gas <sup>ʃ</sup> s <sup>ʃ</sup> er
. gas <sup>ʃ</sup> raj	. gas <sup>ʃ</sup> raw	. mgas <sup>ʃ</sup> s <sup>ʃ</sup> er	. mgas <sup>ʃ</sup> ra
. mgas <sup>ʃ</sup> ri:n	. tags <sup>ʃ</sup> i:r	. mgas <sup>ʃ</sup> s <sup>ʃ</sup> ar	. mgas <sup>ʃ</sup> s <sup>ʃ</sup> era
. mgas <sup>ʃ</sup> s <sup>ʃ</sup> ari:n			
. gat <sup>ʃ</sup> t <sup>ʃ</sup>	‘to throw’		
. gat <sup>ʃ</sup> t <sup>ʃ</sup> at	. gat <sup>ʃ</sup> t <sup>ʃ</sup> aw	. gat <sup>ʃ</sup> t <sup>ʃ</sup> ε:t	. gat <sup>ʃ</sup> t <sup>ʃ</sup> ε:taj
. gat <sup>ʃ</sup> t <sup>ʃ</sup> ε:taw	. gat <sup>ʃ</sup> t <sup>ʃ</sup> ε:t	. gat <sup>ʃ</sup> t <sup>ʃ</sup> ε:na	. jgət <sup>ʃ</sup> t <sup>ʃ</sup>
. tgət <sup>ʃ</sup> t <sup>ʃ</sup>	. jgət <sup>ʃ</sup> t <sup>ʃ</sup> u:n	. tgət <sup>ʃ</sup> t <sup>ʃ</sup>	. tgət <sup>ʃ</sup> t <sup>ʃ</sup> i:n
. tgət <sup>ʃ</sup> t <sup>ʃ</sup> u:n	. ?agət <sup>ʃ</sup> t <sup>ʃ</sup>	. ngət <sup>ʃ</sup> t <sup>ʃ</sup>	. gət <sup>ʃ</sup> t <sup>ʃ</sup>
. gət <sup>ʃ</sup> t <sup>ʃ</sup> aj	. gət <sup>ʃ</sup> t <sup>ʃ</sup> aw	. ga:t <sup>ʃ</sup> t <sup>ʃ</sup>	. ga:t <sup>ʃ</sup> t <sup>ʃ</sup> a

. ga:tʰi:n	. gatʰ	. magtʰu:tʰ	. magtʰu:tʰa
. magtʰu:tʰi:n			
. gatʰatʰ	‘to throw here and there’		
. gatʰətʰat	. gatʰətʰaw	. gatʰatʰtʰ	. gatʰatʰtʰaj
. gatʰatʰtʰaw	. gatʰatʰtʰ	. gatʰatʰtʰna	. jgatʰətʰ
. tɡatʰətʰ	. jɡatʰətʰu:n	. tɡatʰətʰ	. tɡatʰətʰi:n
. tɡatʰətʰu:n	. ʔagatʰətʰ	. ngatʰətʰ	. gatʰətʰ
. gatʰətʰaj	. gatʰətʰaw	. mgatʰətʰ	. mgatʰətʰa
. mgatʰətʰi:n	. tagtʰi:tʰ	. mgatʰatʰ	. mgatʰətʰa
. mgatʰatʰi:n			
. gatʰaʃ	‘to cut repeatedly’		
. gatʰəʃat	. gatʰəʃaw	. gatʰaʃt	. gatʰaʃtaj
. gatʰaʃtaw	. gatʰaʃt	. gatʰaʃna	. jgatʰəʃ
. tɡatʰəʃ	. jɡatʰəʃu:n	. tɡatʰəʃ	. tɡatʰəʃi:n
. tɡatʰəʃu:n	. ʔagatʰəʃ	. ngatʰəʃ	. gatʰəʃ
. gatʰəʃaj	. gatʰəʃaw	. mgatʰəʃ	. mgatʰəʃa
. mgatʰəʃi:n	. tagtʰi:ʃ	. mgatʰəʃ	. mgatʰəʃa
. mgatʰaʃi:n			
. gaðʰðʰ	‘to pierce’		
. gaðʰðʰat	. gaðʰðʰaw	. gaðʰðʰε:t	. gaðʰðʰε:taj
. gaðʰðʰε:taw	. gaðʰðʰε:t	. gaðʰðʰε:na	. jgaðʰðʰ
. tɡəðʰðʰ	. jɡəðʰðʰu:n	. tɡəðʰðʰ	. tɡəðʰðʰi:n
. tɡəðʰðʰu:n	. ʔagəðʰðʰ	. ngəðʰðʰ	. gəðʰðʰ
. gəðʰðʰaj	. gəðʰðʰaw	. ga:ðʰðʰ	. ga:ðʰðʰa
. ga:ðʰðʰi:n	. gaðʰðʰ	. magəðʰu:ðʰ	. magəðʰu:ðʰa
. magəðʰu:ðʰi:n			
. gaʃʃad	‘to seat, wake up (transitive)’		
. gaʃʃidat	. gaʃʃidaw	. gaʃʃadt	. gaʃʃadtaj
. gaʃʃadtaw	. gaʃʃadt	. gaʃʃadna	. jgaʃʃid
. tgaʃʃid	. jgaʃʃidu:n	. tgaʃʃid	. tgaʃʃidi:n
. tgaʃʃidu:n	. ʔagaʃʃid	. ngaʃʃid	. gaʃʃid
. gaʃʃaj	. gaʃʃdaw	. mgaʃʃid	. mgaʃʃa
. mgaʃʃidi:n	.	. mgaʃʃad	. mgaʃʃida
. mgaʃʃadi:n			
. galʰlʰ	‘to decrease’		
. galʰlʰat	. galʰlʰaw	. galʰlʰε:t	. galʰlʰε:taj
. galʰlʰε:taw	. galʰlʰε:t	. galʰlʰε:na	. jgalʰlʰ

. tgəl <sup>ŋ</sup> l <sup>ŋ</sup>	. jgəl <sup>ŋ</sup> l <sup>ŋ</sup> u:n	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup>	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> i:n
. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> u:n	. ʔagəl <sup>ŋ</sup> l <sup>ŋ</sup>	. ngəl <sup>ŋ</sup> l <sup>ŋ</sup>	. gəl <sup>ŋ</sup> l <sup>ŋ</sup>
. gəl <sup>ŋ</sup> l <sup>ŋ</sup> aj	. gəl <sup>ŋ</sup> l <sup>ŋ</sup> aw	. ga:l <sup>ŋ</sup> l <sup>ŋ</sup>	. ga:l <sup>ŋ</sup> l <sup>ŋ</sup> a
. ga:l <sup>ŋ</sup> l <sup>ŋ</sup> i:n	. gəl <sup>ŋ</sup> l <sup>ŋ</sup> a	.	.
.			
. gal <sup>ŋ</sup> l <sup>ŋ</sup> ab	‘to turn over repeatedly’		
. gal <sup>ŋ</sup> l <sup>ŋ</sup> əbat	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əbaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> abt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> abtaj
. gal <sup>ŋ</sup> l <sup>ŋ</sup> abtaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> abt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> abna	. jgal <sup>ŋ</sup> l <sup>ŋ</sup> əb
. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əb	. jgal <sup>ŋ</sup> bu:n	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əb	. tgəl <sup>ŋ</sup> bi:n
. tgəl <sup>ŋ</sup> bu:n	. ʔagal <sup>ŋ</sup> l <sup>ŋ</sup> əb	. ngəl <sup>ŋ</sup> l <sup>ŋ</sup> əb	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əb
. gal <sup>ŋ</sup> baj	. gal <sup>ŋ</sup> baw	. mgal <sup>ŋ</sup> l <sup>ŋ</sup> əb	. mgal <sup>ŋ</sup> ba
. mgal <sup>ŋ</sup> bi:n	. tagl <sup>ŋ</sup> i:b	.	.
.			
. gal <sup>ŋ</sup> l <sup>ŋ</sup> al	‘to reduce’		
. gal <sup>ŋ</sup> l <sup>ŋ</sup> əlat	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əlaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> alt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> altaj
. gal <sup>ŋ</sup> l <sup>ŋ</sup> altaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> alt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> alna	. jgal <sup>ŋ</sup> l <sup>ŋ</sup> əl
. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əl	. jgal <sup>ŋ</sup> l <sup>ŋ</sup> əl:u:n	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əl	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əl:i:n
. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əl:u:n	. ʔagal <sup>ŋ</sup> l <sup>ŋ</sup> əl	. ngəl <sup>ŋ</sup> l <sup>ŋ</sup> əl	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əl
. gal <sup>ŋ</sup> l <sup>ŋ</sup> əlaj	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əlaw	. mgal <sup>ŋ</sup> l <sup>ŋ</sup> əl	. mgal <sup>ŋ</sup> l <sup>ŋ</sup> əla
. mgal <sup>ŋ</sup> l <sup>ŋ</sup> əl:i:n	. tagl <sup>ŋ</sup> l <sup>ŋ</sup> i:l	.	.
.			
. gal <sup>ŋ</sup> l <sup>ŋ</sup> am	‘to clip’		
. gal <sup>ŋ</sup> l <sup>ŋ</sup> əmat	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əmaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> amt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> amtaj
. gal <sup>ŋ</sup> l <sup>ŋ</sup> amtaw	. gal <sup>ŋ</sup> l <sup>ŋ</sup> amt	. gal <sup>ŋ</sup> l <sup>ŋ</sup> amna	. jgal <sup>ŋ</sup> l <sup>ŋ</sup> əm
. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əm	. jgal <sup>ŋ</sup> mu:n	. tgəl <sup>ŋ</sup> l <sup>ŋ</sup> əm	. tgəl <sup>ŋ</sup> mi:n
. tgəl <sup>ŋ</sup> mu:n	. ʔagal <sup>ŋ</sup> l <sup>ŋ</sup> əm	. ngəl <sup>ŋ</sup> l <sup>ŋ</sup> əm	. gal <sup>ŋ</sup> l <sup>ŋ</sup> əm
. gal <sup>ŋ</sup> maj	. gal <sup>ŋ</sup> maw	. mgal <sup>ŋ</sup> l <sup>ŋ</sup> əm	. mgal <sup>ŋ</sup> ma
. mgal <sup>ŋ</sup> mi:n	. tagl <sup>ŋ</sup> i:m	.	.
.			
. gawwad	‘to be a pimp’		
. gawwizat	. gawwidaw	. gawwadt	. gawwadtaj
. gawwadta	. gawwadt	. gawwadna	. jgawwid
. tgawwid	. jgawdu:n	. tgawwid	. tgawdi:n
. tgawdu:n	. ʔagawwid	. ngawwid	. gawwid
. gawdaj	. gawdaw	. mgawwid	. mgawda
. mgawdi:n	. gwa:da	.	.
.			
. gawwam	‘to cause to stand up’		

. gawwimat	. gawwimaw	. gawwamt	. gawwamtaj
. gawwamtaw	. gawwamt	. gawwamna	. jgawwim
. tgawwim	. jgawmu:n	. tgawwim	. tgawmi:n
. tgawmu:n	. ?agawwim	. ngawwim	. gawwim
. gawmaj	. gawmaw	. mgawwim	. mgawma
. mgawmi:n	.	.	.
.			
. ga:s	‘to measure’		
. ga:sat	. ga:saw	. gist	. gistaj
. gistaw	. gist	. gisna	. jgi:s
. tgi:s	. jgi:su:n	. tgi:s	. tgi:si:n
. tgi:su:n	. ?agi:s	. ngi:s	. gi:s
. gi:saj	. gi:saw	. ga:jis	. ga:jsa
. ga:jsi:n	. gja:s	.	.
.			
. ga:l	‘to say’		
. ga:lat	. ga:law	. gilt	. giltaj
. giltaw	. gilt	. gilna	. jgu:l
. tgu:l	. jgu:lu:n	. tgu:l	. tgu:li:n
. tgu:lu:n	. ?agu:l	. ngu:l	. gu:l
. gu:laj	. gu:law	. ga:jil	. ga:jla
. ga:jli:n	. go:l <sup>f</sup>	. magju:l	. magju:la
.			
. ga:m	‘to stand up’		
. ga:mat	. ga:maw	. gimt	. gimtaj
. gimtaw	. gimt	. gimna	. jgu:m
. tgu:m	. jgu:mu:n	. tgu:m	. tgu:mi:n
. tgu:mu:n	. ?agu:m	. ngu:m	. gu:m
. gu:maj	. gu:maw	. ga:jim	. ga:jma
. ga:jmi:n	. go:ma	.	.
.			
. gihas <sup>f</sup>	‘to raise up suddenly, startle’		
. ghəs <sup>f</sup> at	. ghəs <sup>f</sup> aw	. gihas <sup>f</sup> t	. gihas <sup>f</sup> taj
. gihas <sup>f</sup> taw	. gihas <sup>f</sup> t	. gihas <sup>f</sup> na	. jighas <sup>f</sup>
. tighas <sup>f</sup>	. jighəs <sup>f</sup> u:n	. tighas <sup>f</sup>	. tighəs <sup>f</sup> i:n
. tighəs <sup>f</sup> u:n	. ?aghəs <sup>f</sup>	. nighas <sup>f</sup>	. ghas <sup>f</sup>
. ghəs <sup>f</sup> aj	. ghəs <sup>f</sup> aw	. ga:həs <sup>f</sup>	. ga:həs <sup>f</sup> a



. gɑ:hsʰi:n	.	.	.
.			
. giham	‘to close’		
. ghimat	. ghimaw	. gihamt	. gihamtaj
. gihamtaw	. gihamt	. gihamna	. jigham
. tigham	. jighimu:n	. tigham	. tighimi:n
. tighimu:n	. ?agham	. nigham	. gham
. ghimaj	. ghimaw	. gɑ:him	. gɑ:hma
. gɑ:hmi:n	. gahm	. maghu:m	. maghu:ma
. maghu:mi:n			
. gidar	‘to be able’		
. gdirat	. gdiraw	. gidart	. gidartaj
. gidartaw	. gidart	. gidarna	. jigdar
. tigdar	. jigdiru:n	. tigdar	. tigdiri:n
. tigdiru:n	. ?agdar	. nigdar	. gdar
. gidiraj	. gidraw	. gɑ:dir	. gɑ:dra
. gɑ:dri:n	. gudra	. magdu:r (ʔale:h)	. magdu:r (ʔale:h)
. magdu:r (ʔale:hum)			
. giram	‘to take a bite’		
. grimat	. grimaw	. giramt	. giramtaj
. giramtaw	. giramt	. giramna	. jigrim
. tigrim	. jigrimu:n	. tigrim	. tigrimi:n
. tigrimu:n	. ?agrim	. nigrim	. grim
. grimaj	. grimaw	. gɑ:rim	. gɑ:rma
. gɑ:rmi:n	. garm	. magru:m	. magru:ma
. magru:mi:n			
. gizar	‘to go by’		
. gzirat	. gziraw	. gizar	. gizartaj
. gizartaw	. gizar	. gizarna	. jagzir
. tagzir	. jagziru:n	. tagzir	. tagziri:n
. tagziru:n	. ?agzir	. nagzir	. gzir
. gziraj	. gziraw	. gɑ:zir	. gɑ:zra
. gɑ:zri:n	. gazr/gazir	. magzu:r	. magzu:ra
. magzu:ri:n			
. giʔad	‘to sit’		
. gʔidat	. gʔidaw	. giʔadt	. giʔadtaj
. giʔadtaw	. giʔadt	. giʔadna	. jagʔid

. tagŋid	. jagŋidu:n	. tagŋid	. tagŋidi:n
. tagŋidu:n	. ʔagŋid	. nagŋid	. gŋad
. giŋdaj	. giŋdaw	. ga:ŋid	. ga:ŋda
. ga:ŋdi:n	. gŋu:d	.	.
.			
. gəl <sup>ʔ</sup> ab	‘to turn over’		
. gl <sup>ʔ</sup> əbat	. gl <sup>ʔ</sup> əbaw	. gəl <sup>ʔ</sup> abt	. gəl <sup>ʔ</sup> abtaj
. gəl <sup>ʔ</sup> abtaw	. gəl <sup>ʔ</sup> abt	. gəl <sup>ʔ</sup> abna	. jaɡl <sup>ʔ</sup> əb
. taɡl <sup>ʔ</sup> əb	. jaɡl <sup>ʔ</sup> əbu:n	. taɡl <sup>ʔ</sup> əb	. taɡl <sup>ʔ</sup> əbi:n
. taɡl <sup>ʔ</sup> əbu:n	. ʔaɡl <sup>ʔ</sup> əb	. naɡl <sup>ʔ</sup> əb	. gl <sup>ʔ</sup> əb
. gəl <sup>ʔ</sup> baj	. gəl <sup>ʔ</sup> baw	. ga:l <sup>ʔ</sup> əb	. ga:l <sup>ʔ</sup> ba
. ga:l <sup>ʔ</sup> bi:n	. ɡal <sup>ʔ</sup> b	. maɡl <sup>ʔ</sup> u:b	. maɡl <sup>ʔ</sup> u:ba
. maɡl <sup>ʔ</sup> u:bi:n			
.			
. gət <sup>ʔ</sup> aŋ	‘to disconnect’		
. gt <sup>ʔ</sup> əŋat	. gt <sup>ʔ</sup> əŋaw	. gət <sup>ʔ</sup> aŋt	. gət <sup>ʔ</sup> aŋtaj
. gət <sup>ʔ</sup> aŋtaw	. gət <sup>ʔ</sup> aŋt	. gət <sup>ʔ</sup> aŋna	. jiɡt <sup>ʔ</sup> aŋ
. tig <sup>ʔ</sup> t <sup>ʔ</sup> aŋ	. jiɡt <sup>ʔ</sup> əŋu:n	. təɡt <sup>ʔ</sup> aŋ	. tig <sup>ʔ</sup> t <sup>ʔ</sup> əŋi:n
. tig <sup>ʔ</sup> t <sup>ʔ</sup> əŋu:n	. ʔaɡt <sup>ʔ</sup> aŋ	. nəɡt <sup>ʔ</sup> aŋ	. gt <sup>ʔ</sup> aŋ
. gət <sup>ʔ</sup> ŋaj	. gət <sup>ʔ</sup> ŋaw	. ga:t <sup>ʔ</sup> əŋ	. ga:t <sup>ʔ</sup> ŋa
. ga:t <sup>ʔ</sup> ŋi:n	. ɡat <sup>ʔ</sup> ŋ/ɡat <sup>ʔ</sup> əŋ	. maɡt <sup>ʔ</sup> u:ŋ	. maɡt <sup>ʔ</sup> u:ŋa
. maɡt <sup>ʔ</sup> u:ŋi:n			
.			
. gəl <sup>ʔ</sup> at <sup>ʔ</sup> /ɡal <sup>ʔ</sup> at <sup>ʔ</sup>	‘to sit’		
. gl <sup>ʔ</sup> ət <sup>ʔ</sup> at	. gl <sup>ʔ</sup> ət <sup>ʔ</sup> aw	. gəl <sup>ʔ</sup> at <sup>ʔ</sup> t	. gəl <sup>ʔ</sup> at <sup>ʔ</sup> taj
. gəl <sup>ʔ</sup> at <sup>ʔ</sup> taw	. gəl <sup>ʔ</sup> at <sup>ʔ</sup> t	. gəl <sup>ʔ</sup> at <sup>ʔ</sup> na	. jaɡl <sup>ʔ</sup> ət <sup>ʔ</sup>
. taɡl <sup>ʔ</sup> ət <sup>ʔ</sup>	. jaɡl <sup>ʔ</sup> ət <sup>ʔ</sup> u:n	. taɡl <sup>ʔ</sup> ət <sup>ʔ</sup>	. taɡl <sup>ʔ</sup> ət <sup>ʔ</sup> i:n
. taɡl <sup>ʔ</sup> ət <sup>ʔ</sup> u:n	. ʔaɡl <sup>ʔ</sup> ət <sup>ʔ</sup>	. naɡl <sup>ʔ</sup> ət <sup>ʔ</sup>	. gl <sup>ʔ</sup> ət <sup>ʔ</sup>
. gl <sup>ʔ</sup> ət <sup>ʔ</sup> aj	. gl <sup>ʔ</sup> ət <sup>ʔ</sup> aw	. ga:l <sup>ʔ</sup> ət <sup>ʔ</sup>	. ga:l <sup>ʔ</sup> t <sup>ʔ</sup> a
. ga:l <sup>ʔ</sup> t <sup>ʔ</sup> i:n	. ɡal <sup>ʔ</sup> t <sup>ʔ</sup> a	.	.
.			
. gəl <sup>ʔ</sup> a	‘to fry’		
. gəl <sup>ʔ</sup> at	. gəl <sup>ʔ</sup> aw	. gəl <sup>ʔ</sup> ɛ:t	. gəl <sup>ʔ</sup> ɛ:taj
. ɡal <sup>ʔ</sup> ɛ:taw	. ɡal <sup>ʔ</sup> ɛ:t	. ɡal <sup>ʔ</sup> ɛ:na	. jaɡl <sup>ʔ</sup> i:
. taɡl <sup>ʔ</sup> i:	. jaɡl <sup>ʔ</sup> u:n	. taɡl <sup>ʔ</sup> i:	. taɡl <sup>ʔ</sup> i:n
. taɡl <sup>ʔ</sup> u:n	. ʔaɡl <sup>ʔ</sup> i:	. naɡl <sup>ʔ</sup> i:	. gl <sup>ʔ</sup> (ə)
. gl <sup>ʔ</sup> aj	. gl <sup>ʔ</sup> aw	. ga:l <sup>ʔ</sup> i:	. ga:l <sup>ʔ</sup> ja
. ga:l <sup>ʔ</sup> ji:n	. ɡal <sup>ʔ</sup> i:	. maɡl <sup>ʔ</sup> i:	. maɡl <sup>ʔ</sup> i:ja
.			

. gəð <sup>ʕ</sup> ab	‘to hold’		
. gəð <sup>ʕ</sup> əbat	. gəð <sup>ʕ</sup> əbaw	. gəð <sup>ʕ</sup> abt	. gəð <sup>ʕ</sup> abtaj
. gəð <sup>ʕ</sup> abtaw	. gəð <sup>ʕ</sup> abt	. gəð <sup>ʕ</sup> abna	. jağð <sup>ʕ</sup> əb
. tagð <sup>ʕ</sup> əb	. jağð <sup>ʕ</sup> əbu:n	. tagð <sup>ʕ</sup> əb	. tagð <sup>ʕ</sup> əbi:n
. tagð <sup>ʕ</sup> əbu:n	. ʔağð <sup>ʕ</sup> əb	. nağð <sup>ʕ</sup> əb	. gəð <sup>ʕ</sup> əb
. gəð <sup>ʕ</sup> əbaj	. gəð <sup>ʕ</sup> əbaw	. ga:ð <sup>ʕ</sup> əb	. ga:ð <sup>ʕ</sup> əba
. ga:ð <sup>ʕ</sup> bi:n	. gað <sup>ʕ</sup> b/gað <sup>ʕ</sup> əb	. mağð <sup>ʕ</sup> u:b	. mağð <sup>ʕ</sup> u:ba
. mağð <sup>ʕ</sup> u:bi:n			

/k/

. kabat	‘wardrobe/closet’
. kabate:n	(dual)
. kba:ta/kabata:t	(pl.)
. kaba:b	‘grilled meat’
. kabbu:s	‘hat’
. kabbu:se:n	(dual)
. kiba:bi:s	(pl.)
. kabri:t/tʃibri:t/kibri:t	‘matches’
. kabʃ	‘a he sheep’
. kabʃe:n	(dual)
. kba:ʃ	(pl.)
. katif	‘shoulder’
. katfe:n	(dual)
. ktu:f	(pl.)
. katʃtʃa	‘a temporary driver’s license’
. katʃra	‘garbage’
. kaħħa	‘coughing’
. kaħħa	‘a cough’
. kaħħite:n	(dual)
. kaħħa:t	(pl.)
. kadda:d	‘some one making good amount of money’
. kadda:da	(f.)
. kadda:da	(pl.)
. kadda:di:n	(pl.)
. kadir	‘soiled’
. kaða	‘this many, more than one’
. karaz	‘cherries’
. karam	‘generosity’
. kari:m	‘generous’

. kari:ma	(f.)
. kari:h	‘hateful, awful’
. kari:ha	(f.)
. kari:hi:n	(pl.)
. karra:ni:	‘clerk’
. karʃ	‘belly’
. karʃa	(singular)
. karʃite:n	(dual)
. kru:ʃ	(pl.)
. karwa	‘wages’
. kasba:n	‘winner’
. kasba:na	(f.)
. kasba:ni:n	(pl.)
. kastina	‘chestnut’
. kasra	‘a pleat’
. kasrite:n	(dual)
. kasra:t	(pl.)
. kasla:n	‘lazy’
. kasla:na	(f.)
. kisa:la	(pl.)
. kaʃta	‘picnic’
. kaʃxa	‘elegance’
. kaʃkaʃ	‘ruffles’
. kaʃa:kiʃ	(pl.)
. kaʃma	‘eye glasses’
. kaʃmite:n	(dual)
. kaʃma:t	(pl.)
. kaʃab	‘heel’
. kʃu:b	(pl.)
. l-kaʃba	‘the Kaaba’
. kaʃa:la	‘gurantee’
. kafu:	‘a praise word’
. kafi:l	‘gurator’
. kafi:la	(f.)
. kufala	(pl.)
. kaff	‘slap’
. kaffe:n	(dual)
. kfu:f	(pl.)
. kaffa	‘the plate of the scale’

. kaffite:n	(dual)
. kalak	‘bucket’
. kalake:n	(dual)
. kla:ka	(pl.)
. kala:fa	‘over burdening’
. kalaktʃi:	‘dishonest person’
. kalaktʃi:ja	(f.)
. kalaktʃi:ja	(pl.)
. kala:m	‘talk’
. kalb	‘dog’
. kalbe:n	(dual)
. kalba	(f.)
. kalbite:n	(dual f.)
. kla:b	(pl.)
. kalma/kilma	‘word’
. kalmite:n/kilmite:n	(dual)
. kalma:t/kilma:t	(pl.)
. kalwa/kilja	‘kidney’
. kalwite:n/kiljite:n	(dual)
. kala:wi:	(pl.)
. kamar	‘fabric belt’
. kana:ri:	‘canari bird’
. ka:	‘there is (demonstrative)’
. ka:b	‘a large dish’
. ka:ru:ka	‘crib’
. ka:zu:	‘cashew’
. ka:ʃi:	‘tile’
. ka:ʃi:je:n	(dual)
. kiwa:ʃi:	(pl.)
. ka:fir	‘infidel’
. ka:fra	. kuffa:r
. ka:mil	‘perfect’
. ka:mila	(f.)
. kimmal	(pl.)
. ka:wli:	‘gypsy’
. ka:wli:ja	(f.)
. ka:wli:je:n	(dual)
. kawa:wla	(pl.)
. kubr/kubur	‘largeness’

. kufta	‘ground meat with vegetables’
. kuwa:ʃi:	‘traditional earrings’
. ku:ra	‘ball’
. ku:rte:n	(dual)
. kwar	(pl.)
. ku:ʃ	‘elbow’
. ku:ʃe:n	(dual)
. kwa:ʃ	(pl.)
. ku:li:	‘laborer’
. ku:li:ja	(pl.)
. ko:r	‘reel of thread’
. ko:re:n	(dual)
. ki:ra:n	(pl.)
. ko:s	‘a dusty wind’
. kibi:r/tʃibi:r/kbi:r	‘big’
. kbɑ:r	(pl.)
. kitir	‘corner, side’
. kiθir/tʃiθir	‘as much’
. kiθi:r/tʃiθi:r	‘plenty, a lot’
. kθɑ:r	(pl.)
. kihl/kihil	‘kohl’
. kirdɑ:la	‘a piece of traditional jewellery’
. kirdi:ja	‘a piece of traditional jewellery’
. kirfa:ja	‘bed’
. kirfa:jte:n	(dual)
. kara:fi:	(pl.)
. kisa:fa/tʃisa:fa/kasa:fa	‘lowness’
. kisi:fa/tʃisi:fa/kasi:fa	‘bad, low (condition)’
. kisi:ra/ tʃisi:ra	‘broken (figuratively)’
. kisra/tʃisra	‘scrap, piece’
. kisrite:n/tʃisrite:n	(dual)
. ksar	(pl.)
. kisra:t/tʃisra:t	(pl.)
. kiswa/tʃiswa	‘clothing’
. kiswa <sup>11</sup>	‘the cover of al-Ka‘ba’
. kiʃʃa	‘messy hair’
. kifan °	‘shroud’

<sup>11</sup> This form resists affrication because it has a religious status.

. kifane:n °	(dual)		
. kfa:n	(pl.)		
. kill	‘all’		
. killa	‘always’		
. killiʃ	‘not at all’		
. kimm	‘sleeve’		
. kimme:n	(dual)		
. kmu:m	(pl.)		
. ki:s °	‘bag’		
. ki:se:n °	(dual)		
. kja:s	(pl.)		
. ke:t	‘small rowing boat’		
. ke:f	‘liking’		
. ke:f	‘how’		
. ke:la	‘a traditional unit of weight’		
. ke:lte:n	(dual)		
. kjal	(pl.)		
. ke:mri:	‘a type of cotton fabric’		
. ktu:r	‘a traditional game’		
. kle:b	‘dog (dim.)’		
. kle:tʃa	‘a traditional type of cookies’		
. kna:r	‘a desert fruit’		
. kabbar	‘to enlarge’		
. kabbirat	. kabbiraw	. kabbart	. kabbartaj
. kabbartaw	. kabbart	. kabbarna	. jkabbir
. tkabbir	. jkabru:n	. tkabbir	. tkabri:n
. tkabru:n	. ʔakabbir	. nkabbir	. kabbir
. kabraj	. kabraw	. mkabbir	. mkabra
. mkabri:n	. takbi:r	.	.
.			
. katt	‘to spill’		
. kattat	. kattaw	. katte:t	. katte:taj
. katte:taw	. katte:t	. katte:na	. jkitt
. tkitt	. jkittu:n	. tkitt	. tkitti:n
. tkittu:n	. ʔakitt	. nkitt	. kitt
. kittaj	. kittaw	. ka:tt	. ka:tta
. ka:tti:n	. katt	. maktu:t	. maktu:ta
. maktu:ti:n			
. kattaf	‘to fold arms across’		
. kattifat	. kattifaw	. kattaft	. kattaftaj

. kattaftaw	. kattaft	. kattafta	. jkattif
. tkattif	. jkatfu:n	. tkattif	. tkatfi:n
. tkatfu:n	. ?akattif	. nkattif	. kattif
. katfaj	. katfaw	. mkattif	. mkatfa
. mkatfi:n	. takti:f	. mkattaf	. mkattifa
. mkattifi:n			
. ka00ar	‘to increase (transitive)’		
. ka00irat	. ka00iraw	. ka00art	. ka00artaj
. ka00artaw	. ka00art	. ka00arna	. jka00ir
. tka00ir	. jka00ru:n	. tka00ir	. tka00ri:n
. tka00ru:n	. ?aka00ir	. nka00ir	. ka00ir
. ka0raj	. ka0raw	. mka00ir	. mka0ra
. mka0ri:n	. tak0i:r	.	.
.			
. kahh	‘to cough’		
. kahhat	. kahhaw	. kahhe:t	. kahhe:taj
. kahhe:taw	. kahhe:t	. kahhe:na	. jkihh
. tkihh	. jkihhu:n	. tkihh	. tkihhi:n
. tkihhu:n	. ?akihh	. nkihh	. kihh
. kihhaj	. kihhaw	. ka:h	. ka:hha
. ka:hhi:n	. kahh	.	.
.			
. kahhal	‘to wear eyeliner (transitive)’		
. kahhilat	. kahhilaw	. kahhalt	. kahhaltaj
. kahhaltaw	. kahhalt	. kahhalna	. jkahhil
. tkahhil	. jkahlu:n	. tkahhil	. tkahli:n
. tkahlu:n	. ?akahhil	. nakahhil	. kahhil
. kahlaj	. kahlaw	. mkahhil	. mkahla
. mkahli:n	. takhi:l	. mkahhal	. mkahhila
. mkahhali:n			
. kadd	‘to overwork’		
. kaddat	. kaddaw	. kadde:t	. kadde:taj
. kadde:taw	. kadde:t	. kadde:na	. jkidd
. tkidd	. jkiddu:n	. tkidd	. tkiddi:n
. tkiddu:n	. ?akidd	. nkidd	. kidd
. kiddaj	. kiddaw	. ka:dd	. ka:dda
. ka:ddi:n	. kadd	.	.
.			
. kaddar	‘to sadden’		



. kaddirat	. kaddiraw	. kaddart	. kaddartaj
. kaddartaw	. kaddart	. kaddarna	. jkaddir
. tkaddir	. jkadru:n	. tkaddir	. tkadri:n
. tkadru:n	. ?akaddir	. nkaddir	. kaddir
. kadraj	. kadraw	. mkaddir	. mkadra
. mkadri:n	. takdi:r	.	.
.			
. kaððab	‘to lie repeatedly’		
. kaððibat	. kaððibaw	. kaððabt	. kaððabtaj
. kaððabtaw	. kaððabt	. kaððabna	. jkaððib
.			
. tkaððib	. jkathbu:n	. tkaððib	. tkaðbi:n
. tkaðbu:n	. ?akaððib	. nkaððib	. kaððib
. kaðbaj	. kaðbaw	. mkaððib	. mkaðba
. mkaðbi:n	. kaðb/kaðib	.	.
.			
. karrah	‘to cause to be hateful’		
. karrihat	. karrihaw	. karraht	. karrahtaj
. karrahtaw	. karraht	. karrahna	. jkarrih
. tkarrih	. jkarhu:n	. tkarrih	. tkarhi:n
. tkarhu:n	. ?akarrih	. nkarrih	. karrih
. karhaj	. karhaw	. mkarrih	. mkarha
. mkarhi:n	.	.	.
.			
. kassar	‘to break repeatedly (transitive)’		
. kassar	. kassiraw	. kassart	. kassartaj
. kassartaw	. kassart	. kassarna	. jkassir
. tkassir	. jkasru:n	. tkassir	. tkasri:n
. tkasru:n	. ?akassir	. nkassir	. kassir
. kasraj	. kasraw	. mkassir	. mkasra
. mkasri:n	. taksi:r	. mkassar	. mkassira
. mkassari:n			
.			
. kassal	‘to be lazy’		
. kassilat	. kassilaw	. kassalt	. kassaltaj
. kassaltaw	. kassalt	. kassalna	. jkassil
. tkassil	. jkaslu:n	. tkassil	. tkasli:n
. tkaslu:n	. ?akassil	. nkassil	. kassil
. kaslaj	. kaslaw	. mkassil	. mkasla
. mkasli:n	.	.	.
.			
. kaff	‘to turn away’		

. kaʃʃat	. kaʃʃaw	. kaʃʃe:t	. kaʃʃe:taj
. kaʃʃe:taw	. kaʃʃe:t	. kaʃʃe:na	. jkiʃʃ
. tkiʃʃ	. jkiʃʃu:n	. tkiʃʃ	. tkiʃʃi:n
. tkiʃʃu:n	. ʔakiʃʃ	. nkiʃʃ	. kiʃʃ
. kiʃʃaj	. kiʃʃaw	. ka:ʃʃ	. ka:ʃʃa
. ka:ʃʃi:n	. kaʃʃ	.	.
.			
. kaʃʃar	‘to grin’		
. kaʃʃirat	. kaʃʃiraw	. kaʃʃart	. kaʃʃartaj
. kaʃʃartaw	. kaʃʃart	. kaʃʃarna	. jkaʃʃir
. tkaʃʃir	. jkaʃʃu:n	. tkaʃʃir	. tkaʃʃi:n
. tkaʃʃu:n	. ʔakaʃʃir	. nkaʃʃir	. kaʃʃir
. kaʃʃraj	. kaʃʃraw	. mkaʃʃir	. mkaʃʃra
. mkaʃʃri:n	. takʃʃi:r	.	.
.			
. kaʃkaʃ	‘to decorate (e.g. a dress)’		
. kaʃkiʃat	. kaʃkiʃaw	. kaʃkaʃt	. kaʃkaʃtaj
. kaʃkaʃtaw	. kaʃkaʃt	. kaʃkaʃna	. jkaʃkiʃ
. tkaʃkiʃ	. jkaʃkiʃu:n	. tkaʃkiʃ	. tkaʃkiʃi:n
. tkaʃkiʃu:n	. ʔakaʃkiʃ	. nkaʃkiʃ	. kaʃkiʃ
. kaʃkiʃaj	. kaʃkiʃaw	. mkaʃkiʃ	. mkaʃkiʃa
. mkaʃkiʃi:n	. kaʃkiʃa	. mkaʃkaʃ	. mkaʃkiʃa
.			
. kaffax	‘to hit repeatedly’		
. kaffiʁat	. kaffiʁaw	. kaffaxt	. kaffaxtaj
. kaffaxtaw	. kaffaxt	. kaffaxna	. jkaffiʁ
. tkaffiʁ	. jkafʁu:n	. tkaffiʁ	. tkafʁi:n
. tkafʁu:n	. ʔakaffiʁ	. nkaffiʁ	. kaffiʁ
. kafʁaj	. kafʁaw	. mkaffiʁ	. mkafʁa
. mkafʁi:n	. takfi:ʁ	. mkaffax	. mkaffiʁa
. mkaffaxi:n			
.			
. kaffa	‘to be enough’		
. kaffat	. kaffaw	. kaffe:t	. kaffe:taj
. kaffe:taw	. kaffe:t	. kaffe:na	. jkaffi:
. tkaffi:	. jkaffu:n	. tkaffi:	. tkaffi:n
. tkaffu:n	. ʔakaffi:	. nkaffi:	. kaff
. kaffaj	. kaffaw	. mkaffi:	. mkafja
. mkaffi:n/mkafji:n	.	.	.

. kallaf	‘to cost’		
. kallifat	. kallifaw	. kallaft	. kallaftaj
. kallftaw	. kallaft	. kallafna	. jkallif
. tkallif	. jkalfu:n	. tkallif	. tkalfi:n
. tkalfu:n	. ?akallif	. nkallif	. kallif
. kalfaj	. kalfaw	. mkallif	. mkalfa
. mkalfi:n	. takli:f	.	.
. kallam	‘to talk to’		
. kallimat	. kallimaw	. kallamt	. kallamtaj
. kallamtaw	. kallamt	. kallamna	. jkallim
. tkallim	. jkalmu:n	. tkallim	. tkalmi:n
. tkalmu:n	. ?akallim	. nkallim	. kallim
. kalmaj	. kalmaw	. mkallim	. mkalma
. mkalmi:n	. kalɑ:m	.	.
. kammal	‘to complete, finish’		
. kammilat	. kammilaw	. kammalt	. kammaltaj
. kammaltaw	. kammalt	. kammalna	. jkammil
. tkammil	. jkamlu:n	. tkammil	. tkamli:n
. tkamlu:n	. ?akammil	. nkammil	. kammil
. kamlaj	. kamlaw	. mkammil	. mkamla
. mkamli:n	. takmila	. mkammal	. mkammila
. mkammali:n			
. kawwar	‘to make round’		
. kawwirat	. kawwiraw	. kawwart	. kawwartaj
. kawwartaw	. kawwart	. kawwarna	. jkawwir
. tkawwir	. jkawru:n	. tkawwir	. tkawri:n
. tkawru:n	. ?akawwir	. nkawwir	. kawwir
. kawraj	. kawraw	. mkawwir	. mkawra
. mkawri:n	. takwi:r	. mkawwar	. mkawwira
. mkawwari:n			
. kawwak	‘to fill, charge’		
. kawwikat	. kawwikaw	. kawwakt	. kawwaktaj
. kawwaktaw	. kawwakt	. kawwakna	. jkawwik
. tkawwik	. jkawku:n	. tkawwik	. tkawki:n
. tkawku:n	. ?akawwik	. nkawwik	. kawwik
. kawkaj	. kawkaw	. mkawwik	. mkawka
. mkawki:n	. takwi:k	. mkawwak	. mkawwika
. mkawwaki:n			
. kajjas	‘to put in bags’		
. kajjisat	. kajjisaw	. kajjast	. kajjastaj

. kajjastaw	. kajjast	. kajjasna	. jkajjis
. tkajjis	. jkajsu:n	. tkajjis	. tkajsi:n
. tkajsu:n	. ?akajjis	. nkajjis	. kajjis
. kajsaj	. kajsaw	. mkajjis	. mkajsa
. mkajsi:n	. takji:s	. mkajjas	. mkajjisa
. mkajjasi:n			
. kajjaf	‘to be pleased’		
. kajjifat	. kajjifaw	. kajjaft	. kajjaftaj
. kajjaftaw	. kajjaft	. kajjafna	. jkajjif
. tkajjif	. jkajfu:n	. tkajjif	. tkajfi:n
. tkajfu:n	. ?akajjif	. nkajjif	. kajjif
. kajfaj	. kajfaw	. mkajjif	. mkajfa
. mkajfi:n	. takji:f	.	.
.			
. kajjal	‘to weigh’		
. kajjilat	. kajjilaw	. kajjalt	. kajjaltaj
. kajjaltaw	. kajjalt	. kajjalna	. jkajjil
. tkajjil	. jkajlu:n	. tkajjil	. tkajli:n
. tkajlu:n	. ?akajjil	. nkajjil	. kajjil
. kajlaj	. kajlaw	. mkajjil	. mkajla
. mkajli:n	. ke:l	. mkajjal	. mkajjila
. mkajjali:n			
. ka:n	‘to be’		
. ka:nat	. ka:naw	. kint	. kintaj
. kintaw	. kint	. kinna	. jku:n
. tku:n	. jku:nu:n	. tku:n	. tku:ni:n
. tku:nu:n	. ?aku:n	. nku:n	. ku:n
. ku:naj	. ku:naw	.	.
.	. ko:n	.	.
.			
. kibar	‘to grow, become big’		
. kbirat	. kbiraw	. kibart	. kibartaw
. kibartaw	. kibart	. kibarna	. jikbar
. tikbar	. jikbiru:n	. tikbar	. tikbiri:n
. tikbiru:n	. ?akbar	. nikbar	. kbar
. kbiraj	. kbiraw	. ka:bir	. ka:bra
. ka:bri:n	. kibr/kibir	.	.
.			
. kitab	‘to write’		
. ktibat	. ktibaw	. kitabt	. kitabtaj
. kitabtaw	. kitabt	. kitabna	. jaktib
. taktib	. jaktibu:n	. taktib	. taktibi:n

. taktibu:n	. ?aktib	. naktib	. ktib
. kitbaj	. kitbaw	. kɑ:tib	. kɑ:tba
. kɑ:tbi:n	. kita:ba	. maktu:b	. maktu:ba
. maktu:bi:n			
. kiθar	‘to increase’		
. kθirat	. kθiraw	. kiθart	. kiθartaj
. kiθartaw	. kiθart	. kiθarna	. jikθar
. tikθar	. jikθiru:n	. tikθar	. tikθiri:n
. tikθiru:n	. ?akθar	. nikθar	. kθar
. kθiraj	. kθirajw	. kɑ:θir	. kɑ:θra
. kɑ:θri:n	. kaθra	.	.
.			
. kiðab	‘to lie’		
. kðibat	. kðibaw	. kiðabt	. kiðabtaj
. kiðabtaw	. kiðabt	. kiðabna	. jakðib
. takðib	. jakðibu:n	. takðib	. takðibi:n
. takðibu:n	. ?akðib	. nakðib	. kðib
. kiðbaj	. kiðbaw	.	.
.	. kaðb/kaðib	. makðu:b (ʕale:h)	. makðu:b
(ʕale:ha)			
. makðu:b (ʕale:hum)			
. kiraf	‘to work hard’		
. krifat	. krifaw	. kiraft	. kiraftaj
. kiraftaw	. kiraft	. kirafna	. jakrif
. takrif	. jakrifu:n	. takrif	. takrifi:n
. takrifu:n	. ?akrif	. nakrif	. krif
. kirfaj	. kirfaw	. kɑ:rif	. kɑ:rfa
. kɑ:rfi:n	. karf	.	.
.			
. kirah/karah	‘to hate’		
. krihat	. krihaw	. kiraht	. kirahtaj
. kirahtaw	. kiraht	. kirahna	. jikrah
. tikrah	. jikrihu:n	. tikrah	. tikrihi:n
. tikrihu:n	. ?akrah	. nikrah	. krah
. kirhaj	. kirhaw	. kɑ:rih	. kɑ:rha
. kɑ:rhi:n	. kirh	. makru:h	. makru:ha
. makru:hi:n			
. kisab	‘to gain, win’		
. ksibat	. ksibaw	. kisabt	. kisabtaj

. kisabtaŋ	. kisabt	. kisabna	. jiksab
. tiksab	. jiksibu:n	. tiksab	. tiksibi:n
. tiksibu:n	. ʔaksib	. niksab	. ksib
. kisbaj	. kisbaw	. kɑ:sib	. kɑ:sba
. kɑ:sbi:n	. kasb/kasib	.	.
.			
. kisar	‘to break (transitive)’		
. ksirat	. ksiraw	. kisart	. kisartaj
. kisartaw	. kisart	. kisarna	. jaksir
. taksir	. jaksiru:n	. taksir	. taksiri:n
. taksiru:n	. ʔaksir	. naksir	. ksir
. kisraj	. kisraw	. kɑ:sir	. kɑ:sra
. kɑ:sri:n	. kasir	. maksu:r	. maksu:ra
. maksu:ri:n			
.			
. kifʌt	‘to ignore’		
. kfʌtat	. kfʌtaw	. kifʌtt	. kifʌttaj
. kifʌttaw	. kifʌtt	. kifʌtna	. jakʃit
. takʃit	. jakʃitu:n	. takʃit	. takʃiti:n
. takʃitu:n	. ʔakʃit	. nakʃit	. kʃit
. kfʌtaj	. kfʌtaw	. kɑ:ʃit	. kɑ:ʃta
. kɑ:ʃti:n	. kaʃta	.	.
.			
. kifʌh	‘to kick out, pull hair back’		
. kfʌhat	. kfʌhaw	. kifʌht	. kifʌhtaj
. kifʌhtaw	. kifʌht	. kifʌhna	. jikʃaʃ
. tikʃaʃ	. jikʃihu:n	. tikʃaʃah	. tikʃihi:n
. tikʃihu:n	. ʔakʃaʃ	. nikʃaʃ	. kʃaʃ
. kfʌhaj	. kfʌhaw	. kɑ:ʃih	. kɑ:ʃha
. kɑ:ʃhi:n	. kaʃh	.	.
.			
. kifʌχ	‘to dress up’		
. kfʌχat	. kfʌχaw	. kifʌχt	. kifʌχtaj
. kifʌχtaw	. kifʌχt	. kifʌχna	. jikʃaχ
. tikʃaχ	. jikʃiχu:n	. tikʃaχ	. tikʃiχi:n
. tikʃiχu:n	. ʔakʃaχ	. nikʃaχ	. kʃaχ
. kfʌχaj	. kfʌχajw	. kɑ:ʃiχ	. kɑ:ʃχa
. kɑ:ʃχi:n	. kaʃχa	.	.
.			

. kiʃaf	‘to uncover’		
. kʃifat	. kʃifaw	. kiʃaft	. kiʃaftaj
. kiʃaftaw	. kiʃaft	. kiʃafna	. jakʃif
. takʃif	. jakʃifu:n	. takʃif	. takʃifi:n
. takʃifu:n	. ʔakʃif	. nakʃif	. ʔikʃif
. kiʃfaj	. kiʃfaw	. kɑ:ʃif	. kɑ:ʃfa
. kɑ:ʃfi:n	. kaʃf	. makʃu:f	. makʃu:fa
. makʃu:fi:n			
. kifa	‘to be enough’		
. kifat	. kifaw	. kife:t	. kife:taj
. kife:taw	. kife:t	. kife:na	. jakfi:
. takfi:	. jakfu:n	. takfi:	. takfi:n
. takfu:n	. ʔakfi:	. nakfi:	.
.	.	. kɑ:fi:	. kɑ:fja
. kɑ:fji:n	. kfa:ja/kifa:ja	.	.
.			
. kifaχ	‘to hit’		
. kfiχat	. kfiχaw	. kifaχt	. kifaχtaj
. kifaχtaw	. kifaχt	. kifaχna	. jakfiχ
. takfiχ	. jakfiχu:n	. takfiχ	. takfiχi:n
. takfiχu:n	. ʔakfiχ	. nakfiχ	. kfiχ
. kifχaj	. kifχaw	. kɑ:fiχ	. kɑ:fχa
. kɑ:fχi:n	. kfa:χ	. makfu:χ	. makfu:χa
. makfu:χi:n			
. kifar	‘to be infidel, ungratefull to Allah’		
. kfirat	. kfiraw	. kifart	. kifartaj
. kifartaw	. kifart	. kifarna	. jakfir
. takfir	. jakfiru:n	. takfir	. takfiri:n
. takfiru:n	. ʔakfir	. nakfir	. kfir
. kifraj	. kifraw	. kɑ:fir	. kɑ:fra
. kɑ:fri:n	. kifr/kifir	.	.
.			
. kifal	‘to gurantee’		
. kfilat	. kfilaw	. kifalt	. kifaltaj
. kifaltaw	. kifalt	. kifalna	. jakfil
. takfil	. jakfilu:n	. takfil	. takfili:n
. takfilu:n	. ʔakfil	. nakfil	. kfil
. kfilaj	. kfilaw	. kɑ:fil	. kɑ:fla

. kɑ:fli:n	. kɑfɑ:la	. makfu:l	. makfu:la
. makfu:li:n			
. kimaʃ	‘to catch, hold’		
. kmiʃat	. kmiʃaw	. kimaʃt	. kimaʃtaj
. kimaʃtaw	. kimaʃt	. kimaʃna	. jakmiʃ
. takmiʃ	. jakmiʃu:n	. takmiʃ	. takmiʃi:n
. takmiʃu:n	. ʔakmiʃ	. nakmiʃ	. kmiʃ
. kmiʃaj	. kmiʃaw	. kɑ:miʃ	. kɑ:mʃa
. kɑ:mʃi:n	. kamʃ	.	.
.			
/l/			
. lazga	‘tape, mustard plaster’		
. lazga	‘sticky’		
. lagħa	‘pregnant animal’		
. lahdʒa	‘dialect’		
. lahdʒite:n	(dual)		
. lahdʒɑ:t	(pl.)		
. ligan	‘a large dish’		
. ligane:n	(dual)		
. lɡɑ:na	(pl.)		
. ligma	‘a mouthful’		
. ligmite:n	(dual)		
. lɡam	(pl.)		
. la:kin	‘but’		
. lge:ma:t	‘dumplings’		
. lazzag	‘to glue, attach’		
. lazzigat	. lazzigaw	. lazzagt	. lazzagtaj
. lazzagtaw	. lazzagt	. lazzagna	. jlazzig
. tlazzig	. jlazgu:n	. tlazzig	. tlazigi:n
. tlazigu:n	. ʔalazzig	. nlazzig	. lazzig
. lazgaj	. lazgajw	. mlazzig	. mlazga
. mlazgi:n	. talzi:g	. mlazzag	. mlazziga
. mlazzagi:n			
. las <sup>ʕ</sup> s <sup>ʕ</sup> ag	‘to attach, glue’		
. las <sup>ʕ</sup> s <sup>ʕ</sup> əgat	. las <sup>ʕ</sup> s <sup>ʕ</sup> əgaw	. las <sup>ʕ</sup> s <sup>ʕ</sup> agt	. las <sup>ʕ</sup> s <sup>ʕ</sup> agtaj
. las <sup>ʕ</sup> s <sup>ʕ</sup> agtaw	. las <sup>ʕ</sup> s <sup>ʕ</sup> agt	. las <sup>ʕ</sup> s <sup>ʕ</sup> agna	. jlas <sup>ʕ</sup> s <sup>ʕ</sup> əg
. tlas <sup>ʕ</sup> s <sup>ʕ</sup> əg	. jlas <sup>ʕ</sup> gu:n	. tlas <sup>ʕ</sup> s <sup>ʕ</sup> əg	. tlas <sup>ʕ</sup> gi:n



. tlas <sup>ʔ</sup> gu:n	. ʔalas <sup>ʔ</sup> s <sup>ʔ</sup> əg	. nlas <sup>ʔ</sup> s <sup>ʔ</sup> əg	. las <sup>ʔ</sup> s <sup>ʔ</sup> əg
. las <sup>ʔ</sup> gaj	. las <sup>ʔ</sup> gaw	. mlas <sup>ʔ</sup> s <sup>ʔ</sup> əg	. mlas <sup>ʔ</sup> ga
. mlas <sup>ʔ</sup> gi:n	. tals <sup>ʔ</sup> i:g	. mlas <sup>ʔ</sup> s <sup>ʔ</sup> ag	. mlas <sup>ʔ</sup> s <sup>ʔ</sup> əga
. mlas <sup>ʔ</sup> s <sup>ʔ</sup> agi:n			
. laggat <sup>ʔ</sup>	‘to pick up repeatedly’		
. laggət <sup>ʔ</sup> at	. laggət <sup>ʔ</sup> aw	. laggat <sup>ʔ</sup> t	. laggat <sup>ʔ</sup> ataj
. laggat <sup>ʔ</sup> ataw	. laggat <sup>ʔ</sup> t	. laggat <sup>ʔ</sup> na	. jlaggət <sup>ʔ</sup>
. tlaggət <sup>ʔ</sup>	. jlaggət <sup>ʔ</sup> u:n	. tlaggət <sup>ʔ</sup>	. tlaggət <sup>ʔ</sup> i:n
. tlaggət <sup>ʔ</sup> u:n	. ʔalaggət <sup>ʔ</sup>	. nlaggət <sup>ʔ</sup>	. laggət <sup>ʔ</sup>
. lagt <sup>ʔ</sup> aj	. lagt <sup>ʔ</sup> aw	. mlaggət <sup>ʔ</sup>	. mlagt <sup>ʔ</sup> a
. mlagt <sup>ʔ</sup> i:n	. talgi:t <sup>ʔ</sup>	. mlaggat <sup>ʔ</sup>	. mlaggət <sup>ʔ</sup> a
. mlaggat <sup>ʔ</sup> i:n			
. laggam	‘to feed’		
. laggimat	. laggimaw	. laggamt	. laggamtaj
. laggamtaw	. laggamt	. laggamna	. jlaggim
. tlaggim	. jlagmu:n	. tlaggim	. tlagmi:n
. tlagmu:n	. ʔalaggim	. nlaggim	. laggim
. lagmaj	. lagmaw	. mlaggim	. mlagma
. mlagmi:n	. talgi:m	.	.
.			
. la:hag	‘to chase’		
. la:higat	. la:higaw	. la:hagt	. la:hagtaj
. la:hagtaw	. la:hagt	. la:hagna	. jla:hig
. tla:hig	. jla:hgu:n	. tla:hig	. tla:hgi:n
. tla:hgu:n	. ʔala:hig	. nla:hig	. la:hig
. la:hgaj	. la:hgaw	. mla:hig	. mla:hga
. mla:hgi:n	. mla:higa	.	.
.			
. la:g	‘to match’		
. la:gat	. la:gaw	. ligt	. ligtaj
. ligtaw	. ligt	. ligna	. jli:g
. tli:g	. jli:gu:n	. tli:g	. tli:gi:n
. tli:gu:n	. ʔali:g	. nli:g	. li:g
. li:gaj	. li:gaw	. la:jig	. la:jga
. la:jgi:n	.	.	.
.			
. libag	‘to stick’		

. lbigat	. lbigaw	. libagt	. libagtaj
. libagtaw	. libagt	. libagna	. jilbag
. tilbag	. jilbigu:n	. tilbag	. tilbigi:n
. tilbigu:n	. ʔalbag	. nilbag	. lbig
. lbigaj	. lbigaw	. la:big	. la:bga
. la:bgi:n	. labg	.	.
.			
. lihag	‘to chase’		
. lhigat	. lhigaw	. lihagt	. lihagtaj
. lihagtaw	. lihagt	. lihagna	. jilhag
. tilhag	. jilhigu:n	. tilhag	. tilhigi:n
. tilhigu:n	. ʔalhag	. nilhag	. ʔilhag
. lihgaj	. lihgaw	. la:hig	. la:hga
. la:hgi:n	.	.	.
.			
. lizag	‘to stick’		
. lzigat	. lzigaw	. lizagt	. lizagtaj
. lizagtaw	. lizagt	. lizagna	. jilzag
. tilzag	. jilzigu:n	. tilzag	. tilzigi:n
. tilzigu:n	. ʔalzag	. nilzag	. lzag
. lzigaj	. lzigaw	. la:zig	. la:zga
. la:zgi:n	. lazg/lazig	.	.
.			
. ləs <sup>ʰ</sup> ag	‘to stick’		
. ls <sup>ʰ</sup> əgat	. ls <sup>ʰ</sup> əgaw	. ləs <sup>ʰ</sup> agt	. ləs <sup>ʰ</sup> agtaj
. ləs <sup>ʰ</sup> agtaw	. ləs <sup>ʰ</sup> agt	. ləs <sup>ʰ</sup> agna	. jils <sup>ʰ</sup> ag
. tils <sup>ʰ</sup> ag	. jils <sup>ʰ</sup> əgu:n	. tils <sup>ʰ</sup> ag	. tils <sup>ʰ</sup> əgi:n
. tils <sup>ʰ</sup> əgu:n	. ʔals <sup>ʰ</sup> ag	. nils <sup>ʰ</sup> ag	. ls <sup>ʰ</sup> ag
. ls <sup>ʰ</sup> əgaj	. ls <sup>ʰ</sup> əgaw	. la:s <sup>ʰ</sup> əg	. la:s <sup>ʰ</sup> ga
. la:s <sup>ʰ</sup> gi:n	. las <sup>ʰ</sup> g/las <sup>ʰ</sup> əg	.	.
.			
. ligat <sup>ʰ</sup>	‘to pick up’		
. lgət <sup>ʰ</sup> at	. lgət <sup>ʰ</sup> aw	. ligat <sup>ʰ</sup> t	. ligat <sup>ʰ</sup> taj
. ligat <sup>ʰ</sup> taw	. ligat <sup>ʰ</sup> t	. ligat <sup>ʰ</sup> na	. jilgat <sup>ʰ</sup>
. tilgat <sup>ʰ</sup>	. jilgət <sup>ʰ</sup> u:n	. tilgət <sup>ʰ</sup>	. tilgət <sup>ʰ</sup> i:n
. talgət <sup>ʰ</sup> u:n	. ʔalgət <sup>ʰ</sup>	. nalgət <sup>ʰ</sup>	. lgət <sup>ʰ</sup>
. lgət <sup>ʰ</sup> aj	. lgət <sup>ʰ</sup> aw	. la:gət <sup>ʰ</sup>	. la:gt <sup>ʰ</sup> a
. la:gt <sup>ʰ</sup> i:n	. lagt <sup>ʰ</sup> /lagət <sup>ʰ</sup>	.	.

.	
/m/	
. maʔdʒu:r/ma:dʒu:r	‘rewarded’
. mabru:k	‘blessed, congratulations’
. maḥkima	‘court’
. maḥkimte:n	(dual)
. maḥa:kim	(pl.)
. madʒru:ḥ◇	‘wounded’
. madʒru:ḥa◇	(f.)
. midʒa:ri:ḥ◇	(pl.)
. madʒlis◇	‘sitting room’
. matʃbu:s	‘a traditional dish made of rice and meat’
. mitʃa:bi:s	(pl.)
. maraḡ	‘curry’
. mriga	(sigular)
. mardʒa:n◇	‘coral’
. mardʒa:n◇	‘p.n.’
. mardʒila◇	‘manhood’
. mara:dʒil◇	(pl.)
. margadu:ʃ	‘a drink based on herbs’
. marga:b	‘high piece of land’
. marga:be:n	(dual)
. markab/markab	‘boat’
. markaz	‘centre’
. markaze:n	(dual)
. mara:kiz	(pl.)
. markizi:	‘central’
. markizijja	(f.)
. masdʒid◇	‘mosque’
. masdʒide:n◇	(dual)
. masa:dʒid◇	(pl.)
. mastʃi:n	‘poor, mesirable’
. misa:tʃi:n	(pl.)
. masgu:f	‘ceiled’
. maskar	‘stone fish-trap’
. maskare:n	(dual)
. misa:kir	(pl.)

. maski:n	‘poor, mesirable’
. misa:ki:n	(pl.)
. masjad	‘mosque’
. masjade:n	(dual)
. masq:jid	(pl.)
. mafku:r	‘thank you’
. mafgu:l <sup>f</sup>	‘reasonable’
. mafgu:l <sup>f</sup> a	(f.)
. magbara	‘graveyard’
. magbarte:n	(dual)
. maga:bir	(pl.)
. magdira	‘ability’
. magsu:m	‘predestined’
. magfad	‘backside’
. maktab	‘office, desk’
. maktibe:n	(dual)
. maka:tib	(pl.)
. maktiba	‘library, bookstore’
. maktibte:n	(dual)
. maktiba:t	(pl.)
. maktu:b	‘letter’
. maktu:be:n	(dual)
. mika:ti:b	(pl.)
. makka	‘Mekka’
. malgu:f	‘nosey’
. malgu:fa	(f.)
. mila:gi:f	(pl.)
. mandzara	‘a carpenter workshop’
. mandzarte:n	(dual)
. mandzara:t	(pl.)
. mant <sup>f</sup> ega	‘area’
. mant <sup>f</sup> egte:n	(dual)
. mana:t <sup>f</sup> eg	(pl.)
. mawdzu:d	‘available’
. mawdzu:da	(f.)
. mawdzu:di:n	(pl.)
. majnu:n	‘crazy’
. majnu:na	(f.)

. mija:ni:n	(pl.)
. ma:dʒid◊	‘p.n. (m.)’
. ma:riɖʒ	‘rotten’
. mub mihta:j	‘no need’
. mu:dʒib◊	‘special occasion’
. mukajjif	‘air conditioner’
. mukajjife:n	(dual)
. mukajjifa:t	(pl.)
. mo:dʒ	‘wave’
. mo:dʒa	(singular)
. mo:dʒte:n	(dual)
. mo:dʒa:t	(pl.)
. mihta:dʒ	‘needy’
. mihta:dʒe:n	(dual)
. mihta:dʒi:n	(pl.)
. mihta:dʒa	(f.)
. mihta:dʒte:n	(dual f.)
. mihta:dʒa:t	(pl. f.)
. midʒrim	‘criminal’
. midʒrima	(f.)
. midʒrime:n	(dual)
. midʒrimi:m	(pl.)
. mikabba	‘pot’
. mikabbite:n	(dual)
. maχl <sup>ʰ</sup> u:g	‘creature’
. miχa:l <sup>ʰ</sup> i:g	(pl.)
. misk	‘musk’
. miski:n	‘poor, mesirable’
. misa:ki:n	(pl.)
. miswa:k	‘a stick used for tooth brushing’
. miswa:ke:n	(dual)
. misa:wi:k	(pl.)
. miʃbatʃ	‘clip’
. miʃbatʃe:n	(dual)
. miʃa:bitʃ	(pl.)
. miʃbak	‘clip’
. miʃbake:n	(dual)
. miʃa:bik	(pl.)

. miʃkila	‘problem’
. miʃkilte:n	(dual)
. maʃa:kil	(pl.)
. mətʰriga	‘hammer’
. mətʰrigte:n	(dual)
. mətʰa:rig	(pl.)
. migra:ðʰ	‘nail clip’
. migra:ðʰe:n	(dual)
. migra:ri:ðʰ	(pl.)
. migna:sʰ	‘hunting’
. mika:n/mika:n	‘place’
. mika:ne:n/mika:ne:n	(dual)
. ʔama:kin	(pl.)
. mikadda	‘profession’
. mikdir	‘soiled’
. milki:ja	‘ownership’
. mi:da:r	‘fishing rode’
. mi:da:re:n	(dual)
. mija:di:r	(pl.)
. mi:da:f	‘oar’
. mi:da:fe:n	(dual)
. mija:di:f	(pl.)
. mbatʃʃir	‘early’
. mba:rak	‘p.n. (m.)’
. mba:rika	‘p.n. (f.)’
. mtardʒim	‘interpreter, translator’
. mtardʒima	(f.)
. mtardʒimi:n	(pl.)
. mdʒa:bil	‘opposite to’
. l-mħarraq	‘a city in Bahrain’
. mdalgam	‘someone with a full, round body (m.)’
. mdalgima	(f.)
. mdalgimi:n	(pl.)
. mre:ga	‘curry (dim.)’
. mre:kib	‘boat (dim.)’
. maska	‘a grip’
. mtʰalliga	‘divorced (f.)’

. mt <sup>ʕ</sup> alliga:t	(pl.)		
. mʕas <sup>ʕ</sup> gəl <sup>ʕ</sup>	‘skinny’		
. mʕas <sup>ʕ</sup> gəl <sup>ʕ</sup> a	(dual)		
. mʕas <sup>ʕ</sup> gəl <sup>ʕ</sup> i:n	(pl.)		
. mʕfarrag	‘retail’		
. mʕaʕwi:/mʕaʕu:	‘skinny’		
. mʕe:ri:ð <sup>ʕ</sup>	‘nail clip (dim.)’		
. mkajjaf	‘air conditioned’		
. mke:tib	‘desk (dim.)’		
. mke:tibe:n	(dual)		
. mke:tiba:t	(pl.)		
. mjaddar	‘a traditional food made of rice and lentile’		
. mjannan	‘funky’		
. matʕʕaʕ	‘to pluck’		
. matʕʕigat	. matʕʕaw	. matʕʕaʕt	. matʕʕaʕtaj
. matʕʕaʕtaw	. matʕʕaʕt	. matʕʕaʕna	. jmatʕʕiʕ
. tmatʕʕiʕ	. jmatʕʕu:n	. tmatʕʕiʕ	. tmatʕʕi:n
. tmatʕʕu:n	. ʔamatʕʕiʕ	. nmatʕʕiʕ	. matʕʕiʕ
. matʕʕaj	. matʕʕaw	. mmatʕʕiʕ	. mmatʕʕa
. mmatʕʕi:n	. tamʕʕi:ʕ	.	.
.			
. misak	‘to hold’		
. msikat	. msikaw	. misakt	. misaktaj
. misaktaw	. misakt	. misakna	. jamsik
. tamsik	. jamsiku:n	. tamsik	. tamsiki:n
. tamsiku:n	. ʔamsik	. namsik	. msik
. msikaj	. msikaw	. mɑ:sik	. mɑ:ska
. mɑ:ski:n	. mask	. mamsu:k	. mamsu:ka
. mamsu:ki:n			
. milatʕ	‘to marry (officially)’		
. mlitʕat	. mlitʕaw	. milatʕt	. milatʕtaj
. milatʕtaw	. milatʕt	. milatʕna	. jamlitʕ
. tamlitʕ	. jamlitʕu:n	. tamlitʕ	. tamlitʕi:n
. tamlitʕu:n	. ʔamlitʕ	. namlitʕ	. mlitʕ
. mlitʕaj	. mlitʕaw	. mɑ:litʕ	. mɑ:ltʕa
. mɑ:ltʕi:n	. miltʕa	. mamlu:tʕ ʕale:h	. mamlu:tʕ
ʕale:ha			
. mamlu:tʕ ʕale:hum			

/n/	
. nabdʒ/nabidʒ	‘lotus fruit’
. nabdʒa	(singular)
. nabdʒite:n	(dual)
. nati:dʒa	‘result’
. nati:dʒte:n	(dual)
. natɑ:ʒidʒ	(pl.)
. nadʒdʒɑ:r	‘carpenter’
. nadʒdʒɑ:re:n	(dual)
. nidʒɑ:dʒi:r	(pl.)
. nadʒim◇	(p.n.)
. nadʒim◇	‘stars’
. nadʒma◇	(singular)
. nadʒmite:n◇	(dual)
. ndʒu:m◇	(plural)
. nadʒd	‘Najd (in Saudi Arabia)’
. nadʒdi:	;from Najd’
. nadʒdijja	(f.)
. ndʒɑ:da	(pl.)
. nagza	‘a leap’
. nagzite:n	(dual)
. nagzɑ:t	(plural)
. nagʃa	‘an engraving’
. nagʃite:n	(dual)
. nagʃɑ:t	(plural)
. nagga:zi:	‘springy, easy to jump on’
. nagga:zijja	(f.)
. nagwa	‘carefully chosen’
. nadʒis◇	‘impure, filthy’
. nadʒsa◇	(f.)
. nadʒsi:n◇	(pl.)
. najim	‘a kind of grass’
. nɑ:dʒih	‘successful’
. nɑ:dʒha	(f.)
. nɑ:dʒhi:n	(pl.)
. nɑ:rʒi:l/nɑ:ri:l	‘coconut’
. nidʒra	‘fighting’



. nigʻa	‘puddle’		
. nigʻite:n	(dual)		
. ngaʻ	(pl.)		
. nidʒa:sa◊	‘impurity’		
. nge:ʃa	‘an engraving (dim.)’		
. nge:ʃa:t	(pl.)		
. nʃaʒa	‘she sheep’		
. nʃaʒte:n	(dual)		
. nʃaʒa:t	(pl.)		
. nadʒdʒa	‘to save’		
. nadʒdʒat	. nadʒdʒaw	. nadʒdʒe:t	. nadʒdʒe:taj
. nadʒdʒe:tu	. nadʒdʒe:t	. nadʒdʒe:na	. jnadʒdʒi:
. tnadʒdʒi:	. jnadʒdʒu:n	. tnadʒdʒi:	. tnadʒdʒi:n
. tnadʒdʒu:n	. ʔanadʒdʒi:	. nnadʒdʒi:	. nadʒdʒ(i)
. nadʒdʒaj	. nadʒdʒaw	. mnadʒdʒi:	. mnadʒja
. mnadʒdʒi:n <sup>12</sup>	. nidʒa:(t)	.	.
.			
. nadʒdʒaħ	‘to give success to’		
. nadʒdʒiħat	. nadʒdʒiħaw	. nadʒdʒaħt	. nadʒdʒaħtaj
. nadʒdʒaħtaw	. nadʒdʒaħt	. nadʒdʒaħna	. jnadʒdʒiħ
. tnadʒdʒiħ	. jnadʒħu:n	. tnadʒdʒiħ	. tnadʒħi:n
. tnadʒħu:n	. ʔanadʒdʒiħ	. nnadʒdʒiħ	. nadʒdʒiħ
. nadʒħaj	. nadʒħaw	. mnadʒdʒiħ	. mnadʒħa
. mnadʒħi:n	. tandʒi:ħ	.	.
.			
. nagga	‘to select’		
. naggat	. naggaw	. nagge:t	. nagge:taj
. nagge:taw	. nagge:t	. nagge:na	. jnaggi:
. tnaggi:	. jnaggu:n	. tnaggi:	. tnaggi:n
. tnaggu:n	. ʔanaggi:	. nnaggi:	. nagg(i)
. naggaj	. naggaw	. mnaggi:	. mnagja
. mnagji:n/mnaggi:n	.	.	.
.			
. naggaʻ	‘to soak (transitive)’		
. naggiʻat	. naggiʻaw	. naggaʻt	. naggaʻtaj
. naggaʻtaw	. naggaʻt	. naggaʻna	. jnaggiʻ

<sup>12</sup> Also [mnadʒji:n].

. tnaggiŋ	. jnagŋu:n	. tnaggiŋ	. tnagŋi:n
. tnagŋu:n	. ʔanaggiŋ	. nnaggiŋ	. naggiŋ
. nagŋaj	. nagŋaw	. mnaggiŋ	. mnagŋa
. nnagŋi:n	. tanggi:ŋ	. mnaggaf	. mnaggiŋa
. mnaggaf:i:n			
. nakkas	‘to turn upside down (transitive)’		
. nakkisat	. nakkisaw	. nakkast	. nakkastaj
. nakkastaw	. nakkast	. nakkasna	. jnakkis
. tnakkis	. jnaksu:n	. tnakkis	. tnaksi:n
. tnaksu:n	. ʔanakkis	. nnakkis	. nakkis
. naksaj	. naksaw	. mnakkis	. mnaksa
. mnaksi:n	. tanki:s	.	.
.			
. nidʒa	‘to survive’		
. nadʒat	. nidʒaw	. nidʒe:t	. nidʒe:taj
. nidʒe:taw	. nidʒe:t	. nidʒe:na	. jindʒa
. tindʒa	. jindʒo:n	. tindʒa	. tindʒe:n
. tindʒo:n	. ʔandʒa	. nindʒa	. ndʒ(i)
. ndʒaj	. ndʒaw	. na:dʒi:	. na:dʒja
. na:dʒji:n	. nidʒa:(t)	.	.
.			
. nidʒaḥ	‘to succeed, pass’		
. ndʒihat/ndʒaḥat	. ndʒihaw/ndʒaḥaw	. nidʒaḥt	. nidʒaḥtaj
. tindʒihu:n	. nidʒaḥt	. nidʒaḥna	. jindʒaḥ
. tindʒaḥ	. jindʒihu:n	. tindʒaḥ	. tindʒihi:n
. tindʒihu:n	. ʔandʒaḥ	. nindʒaḥ	. ndʒaḥ
. ndʒihaj	. ndʒihaw	. na:dʒih	. na:dʒḥa
. na:dʒhi:n	. nadʒa:ḥ	.	.
.			
. nitʃab	‘to serve food’		
. ntʃibat	. ntʃibaw	. nitʃabt	. nitʃabtaj
. nitʃabtaw	. nitʃabt	. nitʃabna	. jantʃib
. tantʃib	. jantʃibu:n	. tantʃib	. tantʃibi:n
. tantʃibu:n	. ʔantʃib	. nantʃib	. ntʃib
. ntʃibaj	. ntʃibaw	. na:tʃib	. na:tʃba
. na:tʃbi:n	. natʃb/natʃib	.	.
.			
. nətʰag	‘to articulate, speak’		
. ntʰəgat	. ntʰəgaw	. nətʰagt	. nətʰagtaj

. nət <sup>ʰ</sup> ag <sup>ʰ</sup> taw	. nət <sup>ʰ</sup> agt	. nət <sup>ʰ</sup> agna	. jant <sup>ʰ</sup> əg
. tant <sup>ʰ</sup> əg	. jant <sup>ʰ</sup> əgu:n	. tant <sup>ʰ</sup> əg	. tant <sup>ʰ</sup> əgi:n
. tant <sup>ʰ</sup> əgu:n	. ʔant <sup>ʰ</sup> əg	. nant <sup>ʰ</sup> əg	. nt <sup>ʰ</sup> əg
. nt <sup>ʰ</sup> əgaj	. nt <sup>ʰ</sup> əgaw	. na:t <sup>ʰ</sup> əg	. na:t <sup>ʰ</sup> ga
. na:t <sup>ʰ</sup> gi:n	. nət <sup>ʰ</sup> g/nət <sup>ʰ</sup> əg	. mant <sup>ʰ</sup> u:g	. mant <sup>ʰ</sup> u:ga
.			
. nigaz	‘to jump’		
. ngizat	. ngizaw	. nigazt	. nigaztaj
. nigaztaw	. nigazt	. nigazna	. jangiz
. tangiz	. jangizu:n	. tangiz	. tangizi:n
. tangizu:n	. ʔangiz	. nangiz	. ngiz
. ngizaj	. ngizaw	. na:giz	. na:gza
. na:gzi:n	. nagz/nagiz	.	.
.			
. nigaʃ	‘to engrave’		
. ngiʃat	. ngiʃaw	. nigaʃt	. nigaʃtaj
. nigaʃtaw	. nigaʃt	. nigaʃna	. jangiʃ
. tangiʃ	. jangiʃu:n	. tangiʃ	. tangiʃi:n
. tangiʃu:n	. ʔangiʃ	. nangiʃ	. ngiʃ
. ngiʃaj	. ngiʃaw	. na:giʃ	. na:gʃa
. na:gʃi:n	. nagʃ/nagiʃ	.	.
.			
. nigaf	‘to pluck’		
. ngifat	. ngifaw	. nigaft	. nigaftaj
. nigaftaw	. nigaft	. nigafna	. jangif
. tangif	. jangifu:n	. tangif	. tangifi:n
. tangifu:n	. ʔangif	. nangif	. ngif
. ngifaj	. ngifaw	. na:gif	. na:gfa
. na:gfi:n	. nagf/nagif	.	.
.			
. nigal <sup>ʰ</sup>	‘to move’		
. ngəl <sup>ʰ</sup> at	. ngəl <sup>ʰ</sup> aw	. nigal <sup>ʰ</sup> t	. nigal <sup>ʰ</sup> taj
. nigal <sup>ʰ</sup> taw	. nigal <sup>ʰ</sup> t	. nigal <sup>ʰ</sup> na	. jangəl <sup>ʰ</sup>
. tangəl <sup>ʰ</sup>	. jangəl <sup>ʰ</sup> u:n	. tangəl <sup>ʰ</sup>	. tangəl <sup>ʰ</sup> i:n
. tangəl <sup>ʰ</sup> u:n	. ʔangəl <sup>ʰ</sup>	. nangəl <sup>ʰ</sup>	. ngəl <sup>ʰ</sup>
. ngəl <sup>ʰ</sup> aj	. ngəl <sup>ʰ</sup> aw	. na:gəl <sup>ʰ</sup>	. na:gl <sup>ʰ</sup> a
. na:gl <sup>ʰ</sup> i:n	. nagl <sup>ʰ</sup> /nagəl <sup>ʰ</sup>	.	.
.			

. nikar	‘to deny’		
. nkirat	. nkiraw	. nikart	. nikartaj
. nikartaw	. nikart	. nikarna	. jankir
. tankir	. jankiru:n	. tankir	. tankiri:n
. tankiru:n	. ?ankir	. nankir	. nkir
. nkiraj	. nkiraw	. na:kir	. na:kra
. na:kri:n	. nkɑ:r	.	.
.			
. nihag	‘to bray’		
. nhigat	. nhigaw	. nihagt	. nihagtaj
. nihagtaw	. nihagt	. nihagna	. jinhag
. tinhag	. jinhigu:n	. tinhag	. tinhigi:n
. tinhigu:n	. ?anhag	. ninhag	. nhag
. nhigaj	. nhigaw	.	.
.	. nha:g	.	.
.			
. ndzibar	‘to be forced’		
. ndzabrat	. ndzabraw	. ndzibart	. ndzibartaj
. ndzibartaw	. ndzibart	. ndzibarna	. jindzibir
. tindzibir	. jindzabro:n	. tindzibir	. tindzabre:n
. tindzabro:n	. ?andzibir	. nindzibir	. ndzibir
. ndzabraj	. ndzabraw	. mindzibir	. mindzabra
. mindzabri:n	.	.	.
.			
. ndzirah◇	‘to be wounded’		
. ndzarhat◇	. ndzarhaw◇	. ndziraht◇	. ndzirahtaj◇
. ndzirahtu:◇	. ndziraht◇	. ndzirahna◇	. jindzirih◇
. tindzirih◇	. jindzarho:n◇	. tindzirih◇	. tindzarhe:n◇
. tindzarho:n◇	. ?andzirih◇	. nindzirih◇	. ndzirih◇
. ndzarhaj◇	. ndzarhaw◇	. mindzirih◇	. mindzarha◇
. mindzarhi:n◇	.	.	.
.			
. ndzilaʕ	‘to be extracted, kicked out’		
. ndzalaʕat	. ndzalaʕaw	. ndzilaʕt	. ndzilaʕtaj
. ndzilaʕtaw	. ndzilaʕt	. ndzilaʕna	. jindziliʕ
. tindziliʕ	. jindzalaʕo:n	. tindziliʕ	. tindzalaʕe:n
. tindzalaʕo:n	. ?andziliʕ	. nindziliʕ	. ndziliʕ
. ndzalaʕaj	. ndzalaʕaw	. mindziliʕ	. mindzalaʕa

. mindʒalʕi:n	.	.	.
.	.	.	.
. ntʃabb	‘to be silenced’		
. ntʃabbat	. ntʃabbaw	. ntʃabbe:t	. ntʃabbe:taj
. ntʃabbe:taw	. ntʃabbe:t	. ntʃabbe:na	. jintʃabb
. tintʃabb	. jintʃabbo:n	. tintʃabb	. tintʃabbɛ:n
. tintʃabbo:n	. ʔantʃabb	. nintʃabb	. ntʃabb
. ntʃabbaj	. ntʃabbaw	. mintʃabb	. mintʃabba
. mintʃabbi:n	.	.	.
.	.	.	.
. ntʃabb	‘to fall on his face’		
. ntʃabbat	. ntʃabbaw	. ntʃabbe:t	. ntʃabbe:taj
. ntʃabbe:taw	. ntʃabbe:t	. ntʃabbe:na	. jintʃabb
. tintʃabb	. jintʃabbo:n	. tintʃabb	. tintʃabbɛ:n
. tintʃabbo:n	. ʔantʃabb	. nintʃabb	. ntʃabb
. ntʃabbaj	. ntʃabbaw	. mintʃabb	. mintʃabba
. mintʃabbi:n	.	.	.
.	.	.	.
. ntʃisa	‘to be clothed’		
. ntʃisat	. ntʃisaw	. ntʃise:t	. ntʃise:taj
. ntʃise:taw	. ntʃise:t	. ntʃise:na	. jintʃisi:
. tintʃisi:	. jintʃiso:n	. tintʃisi:	. tintʃise:n
. tintʃiso:n	. ʔantʃisi:	. nintʃisi:	. ntʃisi:
. ntʃisaj	. ntʃisaw	. mintʃisi:	. mintʃasja
. mintʃasji:n <sup>13</sup>	.	.	.
.	.	.	.
. ntʃiʕam	‘to be silenced’		
. ntʃaʕmat	. ntʃaʕmaw	. ntʃaʕamt	. ntʃaʕamtaj
. ntʃaʕamtaw	. ntʃaʕamt	. ntʃaʕamna	. jintʃiʕim
. tintʃiʕim	. jintʃaʕmo:n	. tintʃiʕim	. tintʃaʕme:n
. tintʃaʕmo:n	. ʔantʃiʕim	. nintʃiʕim	. ntʃiʕim
. ntʃaʕmaj	. ntʃaʕmaw	. mintʃiʕim	. mintʃaʕma
. mintʃaʕmi:n	.	.	.
.	.	.	.
. ndagg	‘to be knocked, hammered’		
. ndaggat	. ndaggaw	. ndagge:t	. ndagge:taj

<sup>13</sup> Also [mintʃisi:n].

. ndagge:taw	. ndagge:t	. ndagge:na	. jindagg
. tindagg	. jindaggu:n	. tindagg	. tindaggi:n
. tindaggu:n	. ?andagg	. nindagg	. ndagg
. ndaggaj	. ndaggaw	. mindagg	. mindagga
. mindaggi:n	. dagg	.	.
.			
. nsidʒan	‘to be imprisoned’		
. nsadʒnat	. nsadʒnaw	. nsidʒant	. nsidʒantaj
. nsidʒantaw	. nsidʒant	. nsidʒanna	. jinsidʒin
. tinsidʒin	. jinsadʒnu:n	. tinsidʒin	. tinsadʒni:n
. tinsadʒnu:n	. ?ansidʒin	. ninsidʒin	. nsidʒin
. nsadʒnaj	. nsadʒnaw	. minsidʒin	. minsadʒna
. minsadʒni:n	.	.	.
.			
. nfagg	‘to be torn’		
. nfaggat	. nfaggaw	. nfagge:t	. nfagge:taj
. nfagge:taw	. nfagge:t	. nfagge:na	. jinfagg
. tinfagg	. jinfaggu:n	. tinfagg	. tinfaggi:n
. tinfaggu:n	. ?anfagg	. ninfagg	. nfagg
. nfaggaj	. nfaggaw	. minfagg	. minfagga
. minfaggi:n	.	.	.
.			
. nfatʃtʃ	‘to be opened’		
. nfatʃtʃat	. nfatʃtʃaw	. nfatʃtʃe:t	. nfatʃtʃe:taj
. nfatʃtʃe:taw	. nfatʃtʃe:t	. nfatʃtʃe:na	. jinfatʃtʃ
. tinfatʃtʃ	. jinfatʃtʃu:n	. tinfatʃtʃ	. tinfatʃtʃi:n
. tinfatʃtʃu:n	. ?anfatsʃtʃ	. ninfatʃtʃ	. nfatʃtʃ
. nfatʃtʃaj	. nfatʃtʃaw	. minfatʃtʃ	. minfatʃtʃa
. minfatʃtʃi:n	.	.	.
.			
. nfahag	‘to be opened (e.g. oyster)’		
. nfahgat	. nfahgaw	. nfahagt	. nfahagtaj
. nfahgtaw	. nfahagt	. nfahagna	. jinfihig
. tinfihig	. jinfahgo:n	. tinfihig	. tinfahgi:n
. tinfahgo:n	. ?anfihig	. ninfihig	. nfihig
. nfihgaj	. nfihgaw	. minfihig	. minfahga
. minfahgi:n	.	.	.
.			

. nfitag	‘to be ripped, unstitched’		
. nfitgat	. nfitgaw	. nfitagt	. nfitagtaj
. nfitagtaw	. nfitagt	. nfitagna	. jinfitag
. tinfitig	. jinfatgo:n	. tinfitig	. tinfatgi:n
. tinfatgo:n	. ?anfitgin	. ninfitig	. nfitig
. nfitgaj	. nfitgaw	. minfitig	. minfatga
. minfatgi:n	.	.	.
.			
. nfidzar	‘to be exploded’		
. nfadzrat	. nfadzraw	. nfidzart	. nfidzartaj
. nfidzartaw	. nfidzart	. nfidzarna	. jinfidzir
. tinfidzir	. jinfadzro:n	. tinfidzir	. tinfadzir:n
. tinfadzro:n	. ?anfidzir	. ninfidzir	. nfidzir
. nfadzraj	. nfadzraw	. minfidzir	. minfadzra
. minfadzir:n	. nfidzɑ:r	.	.
.			
. ngat <sup>ʔ</sup> t <sup>ʔ</sup>	‘to be thrown’		
. ngat <sup>ʔ</sup> t <sup>ʔ</sup> at	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> aw	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> ε:t	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> ε:taj
. ngat <sup>ʔ</sup> t <sup>ʔ</sup> ε:taw	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> ε:t	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> ε:na	. jingat <sup>ʔ</sup> t <sup>ʔ</sup>
. tingat <sup>ʔ</sup> t <sup>ʔ</sup>	. jingat <sup>ʔ</sup> t <sup>ʔ</sup> o:n	. tingat <sup>ʔ</sup> t <sup>ʔ</sup>	. tingat <sup>ʔ</sup> t <sup>ʔ</sup> ε:n
. tingat <sup>ʔ</sup> t <sup>ʔ</sup> o:n	. ?angat <sup>ʔ</sup> t <sup>ʔ</sup>	. ningat <sup>ʔ</sup> t <sup>ʔ</sup>	. ngat <sup>ʔ</sup> t <sup>ʔ</sup>
. ngat <sup>ʔ</sup> t <sup>ʔ</sup> aj	. ngat <sup>ʔ</sup> t <sup>ʔ</sup> aw	. mingat <sup>ʔ</sup> t <sup>ʔ</sup>	. mingat <sup>ʔ</sup> t <sup>ʔ</sup> a
. mingat <sup>ʔ</sup> t <sup>ʔ</sup> i:n	.	.	.
.			
. ngað <sup>ʔ</sup> ð <sup>ʔ</sup>	‘to be peirced’		
. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> at	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> aw	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:t	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:taj
. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:taw	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:t	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:na	. jingað <sup>ʔ</sup> ð <sup>ʔ</sup>
. tingað <sup>ʔ</sup> ð <sup>ʔ</sup>	. jingað <sup>ʔ</sup> ð <sup>ʔ</sup> u:n	. tingað <sup>ʔ</sup> ð <sup>ʔ</sup>	. tingað <sup>ʔ</sup> ð <sup>ʔ</sup> ε:n
. tingað <sup>ʔ</sup> ð <sup>ʔ</sup> o:n	. ?angað <sup>ʔ</sup> ð <sup>ʔ</sup>	. ningað <sup>ʔ</sup> ð <sup>ʔ</sup>	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup>
. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> aj	. ngað <sup>ʔ</sup> ð <sup>ʔ</sup> aw	. mingað <sup>ʔ</sup> ð <sup>ʔ</sup>	. mingað <sup>ʔ</sup> ð <sup>ʔ</sup> a
. mingað <sup>ʔ</sup> ð <sup>ʔ</sup> i:n	.	.	.
.			
. ngiram	‘to be eaten partly’		
. ngarmat	. ngarmaw	. ngiramt	. ngiramtaj
. ngiramtaw	. ngiramt	. ngiramna	. jingirim
. tingirim	. jingarmo:n	. tingirim	. tingarme:n
. tingarmo:n	. ?angirim	. ningirim	. ngirim
. ngirmaj	. ngirmaw	. mingirim	. mingarma

## . mingarmi:n

. ngəṭʰaŋ	‘to be disconnected’		
. ngatʰyat	. ngatʰyaw	. ngəṭʰaŋt	. ngəṭʰaŋtaj
. ngəṭʰaŋtaw	. ngəṭʰaŋt	. ngəṭʰaŋna	. jingəṭʰaŋ
. tingəṭʰaŋ	. jingəṭʰaŋo:n	. tingəṭʰaŋ	. tingəṭʰaŋe:n
. tingəṭʰaŋo:n	. ʔangəṭʰaŋ	. ningəṭʰaŋ	. ngəṭʰaŋ
. ngatʰyaŋ	. ngatʰyaw	. mingəṭʰaŋ	. mingəṭʰaŋa
. mingəṭʰaŋi:n	. ngəṭʰa:ŋ	.	.

. ngəlʰab	‘to be turned over’		
. ngəlʰbat	. ngəlʰbaw	. ngəlʰabt	. ngəlʰabtaj
. ngəlʰabtaw	. ngəlʰabt	. ngəlʰabna	. jingəlʰab
. tingəlʰab	. jingəlʰabo:n	. tingəlʰab	. tingəlʰabe:n
. tingəlʰabo:n	. ʔangəlʰab	. ningəlʰab	. ngəlʰab
. ngəlʰbaj	. ngəlʰbaw	. mingəlʰab	. mingəlʰaba
. mingəlʰabi:n	.	.	.

. nkadd	‘to be exhausted’		
. nkaddat	. nkaddaw	. nkadde:t	. nkadde:taj
. nkadde:taw	. nkadde:t	. nkadde:na	. jinkadd
. tinkadd	. jinkaddo:n	. tinkadd	. tinkadde:n
. tinkaddo:n	. ʔankadd	. ninkadd	. nkadd
. nkaddaj	. nkaddaw	. minkadd	. minkadda
. minkaddi:n	.	.	.

. nkisar	‘to be broken’		
. nkasrat	. nkasraw	. nkisart	. nkisartaj
. nkisartaw	. nkisart	. nkisarna	. jinkisir
. tinkisir	. jinkasru:n	. tinkisir	. tinkasri:n
. tinkasru:n	. ʔankisir	. ninkisir	. nkisir
. nkasraj	. nkasraw	. minkisir	. minkasra
. minkasri:n	.	.	.

. nkatt	‘to be spilled’		
. nkattat	. nkattaw	. nkatte:t	. nkatte:taj
. nkatte:taw	. nkatte:t	. nkatte:na	. jinkatt
. tinkatt	. jinkatto:n	. tinkatt	. tinkatte:n
. tinkatto:n	. ʔankatt	. ninkatt	. nkatt
. nkattaj	. nkattaw	. minkatt	. minkatta



. minkatti:n	.	.	.
.	.	.	.
. nkiraf	'to be exhausted'		
. nkarfat	. nkarfaw	. nkarafat	. nkarafatj
. nkarafatj	. nkaraf	. nkarafna	. jinkirif
. tinkirif	. jinkarfo:n	. tinkirif	. tinkarfe:n
. tinkarfo:n	. ?ankirif	. ninkirif	. nkirif
. nkarfaj	. nkarfaw	. minkirif	. minkarfa
. minkarfi:n	.	.	.
.	.	.	.

/h/

. hadʒdʒa:n	'camel breeder'		
. hadʒdʒa:na	(pl.)		
. (ha)ðɑ:k	'that (demonstrative, sing. m.)'		
. (ha)ði:k/(ha)ði:tʃ	'that (demonstrative, sing. f.)'		
. hamtʃa	'a handful'		
. hamtʃite:n	(dual)		
. ha l-kubur	'this big'		
. ha l-kibe:r	'this big (dim.), this small'		
. hagwa	'belief, assumption'		
. ho:daɖʒ	'a cabinet placed on a camel for women'		
. hidʒra	'immigration'		
. hidʒri:	'the name of the Islamic calendar'		
. haga	'to suppose, think'		
. hagat	. hagaw	. hage:t	. hagetaj
. hage:taw	. hage:t	. hage:na	. jhaga
. thaga	. jhago:n	. thaga	. thage:n
. thago:n	. ?ahagi:	. nhagi:	. hag
. hagaj	.	. mhagi:	. mhagja
. mhagi:n	.	.	.
.	.	.	.
. hidʒam	'to attack'		
. hdʒimat	. hdʒimaw	. hidʒamt	. hidʒamtaj
. hidʒamtaw	. hidʒamt	. hidʒamna	. jahdʒim
. tahdʒim	. jahdʒimu:n	. tahdʒim	. tahdʒimi:n
. tahdʒimu:n	. ?ahdʒim	. nahdʒim	. hdʒim
. hdʒimaj	. hdʒimaw	. ha:dʒim	. ha:dʒima
. ha:dʒimi:n	. hudʒu:m	.	.

/w/			
. warag	‘paper’		
. wriga	(singular)		
. wrighte:n	(dual)		
. ?awra:g	(pl.)		
. wartʃ	‘thigh’		
. wartʃe:n	. wru:tʃ		
. wagt	‘time’		
. wagte:n	(dual)		
. ?awga:t	(pl.)		
. wagfa	‘posture’		
. waka:la	‘agency’		
. waki:l	‘vice principle, representative’		
. waki:la	(f.)		
. wukala	(pl.)		
. il-wakra	‘a town in Qatar’		
. wahga	‘trouble’		
. wajh	‘face’		
. wajhe:n	(dual)		
. wju:h	(pl.)		
. wa:dʒib	‘duty’		
. wa:ʒid	‘plenty, very’		
. wa:jda	(f.)		
. wa:ʒdi:n	(pl.)		
. widʒaʕ	‘pain’		
. il-witʃe:r	‘a town in Qatar’		
. wriga	‘playing cards’		
. waffadʒ	‘to guide’		
. waffidʒat	. waffidʒaw	. waffadʒt	. waffadʒtaj
. waffadʒtaw	. waffadʒ	. waffadʒna	. jwaffidʒ
. twaffidʒ	. jwafdʒu:n	. twaffidʒ	. twafdʒi:n
. twafdʒu:n	. ?awaffidʒ	. nwaffidʒ	. waffidʒ
. wafdʒaj	. wafdʒaw	. mwaffidʒ	. mwafdʒa
. mwafdʒi:n	. tawfi:dʒ	. mwaffadʒ	. mwaffidʒa
. waffadʒi:n			
. waffag	‘to guide’		
. waffigat	. waffigaw	. waffagt	. waffagtaj

. waffagtaw	. waffagt	. waffagna	. jwaffig
. twaffig	. jwafgu:n	. twaffig	. twafgi:n
. twafgu:n	. ?awaffig	. nwaffig	. waffig
. waffgaj	. wafgaw	. mwaffig	. mwafga
. mwafgi:n	. tawfi:g	. mwaffag	. mwaffiga
. mwaffagi:n			
. waggad <sup>f</sup>	‘to wake up (transitive)’		
. waggad <sup>f</sup> at	. waggad <sup>f</sup> aw	. waggad <sup>f</sup> t	. waggad <sup>f</sup> taj
. waggad <sup>f</sup> taw	. waggad <sup>f</sup> t	. waggad <sup>f</sup> na	. jwaggad <sup>f</sup>
. twaggad <sup>f</sup>	. jwaggad <sup>f</sup> u:n	. twaggad <sup>f</sup>	. twagd <sup>f</sup> i:n
. twagd <sup>f</sup> u:n	. ?awaggad <sup>f</sup>	. nwaggad <sup>f</sup>	. waggi <sup>f</sup>
. wagd <sup>f</sup> aj	. wagd <sup>f</sup> aw	. mwaggad <sup>f</sup>	. mwagd <sup>f</sup> a
. mwagd <sup>f</sup> i:n	.	.	.
.			
. waggaf	‘to stand up, stop, cause to stop’		
. waggifat	. waggifaw	. waggaf	. waggafat
. waggafaw	. waggaf	. waggafna	. jwaggif
. twaggif	. jwagfu:n	. twaggif	. twagfi:n
. twgfu:n	. ?awaggif	. nwaggif	. waggif
. wafaj	. wafaw	. mwaggif	. mwafga
. mwagfi:n	.	.	.
.			
. wakkal	‘to authorize’		
. wakkilat	. wakkilaw	. wakkalt	. wakkaltaj
. wakkaltaw	. wakkalt	. wakkalna	. jwakkil
. twakkil	. jwaklu:n	. twakkil	. twakli:n
. twaklu:n	. ?awakkil	. nwakkil	. wakkil
. waklaj	. waklaw	. mwakkil	. mwakla
. mwakli:n	. tawki:l	.	.
.			
. waghag	‘to get in trouble (transitive)’		
. waghigat	. waghigaw	. waghagt	. waghagtaj
. waghagtaw	. waghagt	. waghagna	. jwaghig
. twaghig	. jwaghgu:n	. twaghig	. twahgi:n
. twahgu:n	. ?awaghig	. nwaghig	. waghig
. wahgaj	. wahgaw	. mwaghig	. mwahga
. mwahgi:n	. tawhi:ga	.	.
.			
. wa:rad3	‘to match’		

. wa:ridʒat	. wa:ridʒaw	. wa:radʒt	. wa:radʒtaj
. wa:radʒtaw	. wa:radʒt	. wa:radʒna	. jwa:ridʒ
. twa:ridʒ	. jwa:rdʒu:n	. twa:ridʒ	. twa:rdʒi:n
. twa:rdʒu:n	. ʔawa:ridʒ	. nwa:ridʒ	. wa:ridʒ
. wa:rdʒaj	. wa:rdʒaw	. mwa:ridʒ	. mwa:rdʒa
. mwa:rdʒi:n	.	.	.
.			
. wa:fag	‘to agree’		
. wa:figat	. wa:figaw	. wa:fagt	. wa:fagtaj
. wa:fagtaw	. wa:fagt	. wa:fagna	. jwa:fig
. twa:fig	. jwa:fgu:n	. twa:fig	. twa:figi:n
. rwa:fgu:n	. ʔawa:fig	. nwa:fig	. wa:fig
. wa:fgaj	. wa:igaw	. mwa:fig	. mwa:fga
. mwa:figi:n	. mwa:figa	.	.
.			
. wa:jah	‘to meet’		
. wa:jihat	. wa:jihaw	. wa:jaht	. wa:jahtaj
. wa:jahtaw	. wa:jaht	. wa:jahna	. jwa:jih
. twa:jih	. jwa:jhu:n	. twa:jih	. twa:jhi:n
. twa:jhu:n	. ʔawa:jih	. nwa:jih	. wa:jih
. wa:jhaj	. wa:jhaw	. mwa:jih	. mwa:jha
. mwa:jhi:n	. mwa:jaha	.	.
.			
. wigaf	‘to stop, stand’		
. wgifat	. wgifaw	. wigaft	. wigaftaj
. wigaftaw	. wigaft	. wigafna	. jo:gaf
. to:gaf	. jo:gifu:n	. to:gaf	. to:gifi:n
. to:gifu:n	. ʔo:gaf	. no:gaf	. ʔo:gaf
. ʔo:gifaj	. ʔo:gifaw	. wa:gif	. wa:gfa
. wa:gfi:n	. wgu:f	.	.
.			
/j/			
. jarju:r	‘shark fish’		
. jarju:re:n	(dual)		
. jira:ji:r	(pl.)		
. jas <sup>ʕ</sup> s <sup>ʕ</sup>	‘plaster’		
. jaʕalkum	‘pray, wish that you have....’		
. jalsa	‘(a) sitting, gathering’		

. jamda	‘(a) freezing’
. jamkin/jimkin	‘maybe’
. jamm	‘near, beside’
. janzibi:l	‘ginger’
. ja:θu:m	‘nightmare’
. ja:zuwwa	‘nutmeg’
. ja:gu:t	‘ruby’
. ja:gu:t	‘p.n. (m)’
. ja:hil	‘kid’
. ja:hile:n	(dual)
. jahha:l	(pl.)
. ja:z la	‘he could, was permitted to’
. ja:z liha	(f.)
. ja:z lihum	(pl.)
. ja:jiz la	‘he can, is permitted to’
. ja:jiz liha	(f.)
. ja:jiz lihum	(pl.)
. ja:l	‘the edge of water wells’
. ja:mʕa	‘amulet’
. ju:nijja	‘a big sac’
. ju:nite:n	(dual)
. ju:nijja:t	(pl.)
. jidad	‘ablution’
. jiru:	‘puppy’
. jirwe:n	(dual)
. jra:wa	(pl.)
. jidu:d	‘ablution’
. jift	‘an ointment used by divers’
. jimi:ʕ	‘together’
. jħala	‘jar’
. jda:r	‘wall’
. jda:re:n	(dual)
. jidra:n	(pl.)
. jraba	‘scabies’
. jla:l	‘hair cover’
. jla:le:n	(dual)
. ʔajilla	(pl.)
. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup>	‘to plaster’

. jas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> at	. jas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> aw	. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup> t	. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup> taj
. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup> taw	. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup> t	. jas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup> na	. jjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>
. tjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>	. jjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> u:n	. tjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>	. tjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> i:n
. tjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> u:n	. ʔajas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>	. njas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>	. jas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>
. jas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> aj	. jas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> aw	. mjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup>	. mjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> a
. mjas <sup>ʕ</sup> s <sup>ʕ</sup> əs <sup>ʕ</sup> i:n	.	. mjas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup>	. mjas <sup>ʕ</sup> s <sup>ʕ</sup> as <sup>ʕ</sup>
.			
. jaff	‘to dry (intransitive)’		
. jaffat	. jaffaw	. jaffe:t	. jaffe:taj
. jaffe:taw	. jaffe:t	. jaffe:na	. jjiff
. tjiff	. jjiffu:n	. tjiff	. tjiffi:n
. tjiffu:n	. ʔajiff	. njiff	. jiff
. jiffaj	. jiffaw	.	.
.	. jaff	.	.
.			
. jaffaf	‘to dry (transitive)’		
. jaffifat	. jaffifaw	. jaffaft	. jaffaftaj
. jaffaftaw	. jaffaft	. jaffafna	. jjaffif
. tjaffif	. jjaffifu:n	. tjaffif	. tjaffifi:n
. tjaffifu:n	. ʔajaffif	. njaffif	. jaffif
. jaffifaj	. jaffifaw	. mjaffif	. mjaffifa
. mjaffifi:n	.	. mjaffaf	. mjaffifa
. mjaffafi:n			
.			
. jann	‘to be crazy’		
. jannat	. jannaw	. janne:t	. janne:taj
. janne:taw	. janne:t	. janne:na	. jjinn
. tjinn	. jjinnu:n	. tjinn	. tjinni:n
. tjinnu:n	. ʔajinn	. njinn	. jinn
. jinnaj	. jinnaw	.	.
.	. jinu:n	.	.
.			
. ja:z ʕan-	‘to get off s.o.’s back’		
. ja:zat	. ja:zaw	. jizt	. jiztaj
. jiztaw	. jizt	. jizna	. jju:z
. tju:z	. jju:zu:n	. tju:z	. tju:zi:n
. tju:zu:n	. ʔaju:z	. nju:z	. ju:z
. ju:zaj	. ju:zaw	.	.
.	.	.	.
.			
. jawwad	‘to hold’		
. jawwidat	. jawwidaw	. jawwadt	. jawwadtaj
. jawwadaw	. jawwadt	. jawwadna	. jjawwid

. tjawwid	. jjawdu:n	. tjawwid	. tjawdi:n
. tjawdu:n	. ?ajawwid	. njawwid	. jawwid
. jawdaj	. jawdaw	. mjawwid	. mjawda
. mjawdi:n	.	. mjawwad	. mjawwida
. mjawwadi:n			
. jawwaz	‘to marry off’		
. jawwizat	. jawwizaw	. jawwazt	. jawwaztaj
. jawwaztaw	. jawwazt	. jawwazna	. jjawwiz
. tjawwiz	. jjawzu:n	. tjawwiz	. tjawzi:n
. tjawzu:n	. ?ajawwiz	. njawwiz	. jawwiz
. jawzaj	. jawzaw	. mjawwiz	. mjawza
. mjawzi:n	. tajwi:z	.	.
.			
. jimid	‘to freeze, stay still’		
. jmidat	. jmidaw	. jimadt	. jimidtaj
. jimidatw	. jimidt	. jimidna	. ji:mad
. ti:mad	. ji:midu:n	. ti:mad	. ti:midi:n
. ti:midu:n	. ?ajmad	. ni:mad	. jmad
. jmidaj	. jmidaw	. ja:mid	. ja:mda
. ja:mdi:n	.	.	.
.			
. jilas	‘to sit’		
. jilsat	. jilsaw	. jilast	. jilastaj
. jilastaw	. jilast	. jilasna	. ji:lis
. ti:lis	. ji:lisu:n	. ti:lis	. ti:lisi:n
. ti:lisu:n	. ?ajlis	. najlis	. jlis
. jilsaj	. jilsaw	. ja:lis	. ja:lisa
. ja:lsi:n	.	.	.
.			
. jannan	‘to cause to be crazy’		
. janninat	. janninaw	. jannant	. jannantaj
. jannantaw	. jannant	. jannanna	. jjannin
. tjannin	. jjanninu:n	. tjannin	. tjannini:n
. tjaninu:n	. ?ajannin	. njannin	. jannin
. janninaj	. janninaw	. mjannin	. mjannina
. mjannini:n	.	.	.
.			
. ja:las	‘to sit with’		
. ja:lisat	. ja:lisaw	. ja:last	. ja:lastaj
. ja:lastaw	. ja:last	. ja:lasna	. jja:lis
. tja:lis	. jja:lsu:n	. tja:lis	. tja:lsi:n

. tja:lsu:n

. ja:lsaj

. mja:lsi:n

.

. ʔaja:lis

. ja:lsaw

. mja:lisa

. nja:lis

. mja:lis

.

. ja:lis

. mja:lsa

.



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