L-alternations in Taqbaylit

Amazigh BEDAR & Lucie QUELLEC

Abstract

The aim of this paper is to analyze the status of /l/ in standard Taqbaylit (StT) and the varieties of Ouadhia (OuT) and Chemini (ChT) where it surfaces respectively [l], [j] and [ɹ]. In the latter varieties OuT and ChK, /l/ is subject to lenition. We analyze the data in Element Theory (Backley 2011, 2012; Harris 1990; Kaye, Lowenstamm & Vergnaud 1985, 1990; Scheer 1996) and we propose that lenition results from three factors: i) the bipositional nature of /l/, ii) the loss of its subsegmental content and iii) its relationship with adjacent segments.

Keywords: liquids, lenition, bipositionality, branching, Taqbaylit, Berber

1. Introduction

The aim of this paper is to understand the behavior and the internal content of /l/ in Taqbaylit[1], more precisely in the varieties spoken in Ouadhia (OuT) and Chemini (ChT)[2]. We will compare our data with standard Taqbaylit (StT) which is the most widespread variety and which is commonly used in educational and official institutions in Algeria. Our analysis is couched within the CV framework (Guerssel 1992 for CV in Berber, Lowenstamm 1996) of syllabic structure and the Element Theory framework (Backley 2011; Harris 1990; Kaye, Lowenstamm & Vergnaud 1985, 1990; Scheer 1996) of segmental structure.
As shown in (1), the liquid /l/ is subject to lenition in the varieties of Ouadhia and Chemini. In the contexts where [l] appears in StT, the consonant is realized as [j] in OuT and [ɹ] in ChT. In all three varieties, /l/ surfaces as [ll] in geminate contexts such as the intensive form of verbs exemplified in (1.c).

(1)	StT	OuT	ChT	Gloss
a. VLV[3]	[ali]	[aji]	[aɹi]	"to climb.aor"
b. L#	[ul]	[uj]	[uɹ]	"heart"
c. LL	[ðlu]/[ðəllu]	[ðju]/[ðəllu]	[ðɹu]/[ðəllu]	"to visit.aor/int"

2. The distribution of /l/

To our knowledge, the behavior of /l/ in Taqbaylit varieties has not been studied in detail in preceding work. However, the behavior of liquids in a related language, Tarifit Berber, has been quite extensively studied. We start with a summary of an important study on Tarifit Berber liquids. Dell & Tangi (1993) and Tangi (1991) analyzed the Ath-Sidhar variety of Tarifit (Rifian) where the vocalization of /r/ leads, in numerous contexts, to an [a]. This /r/ which also surfaces as [r] is opposed to some realizations of [r], which is the phonetic interpretation of an underlying /l/. However, this underlying /l/ never surfaces as [l]. /l/ surfaces as [r] in most contexts and has other realizations when it is in contact with other segments. The complete distribution of the segments /l/ and /r/ in Ath-Sidhar Tarifit is given in the table in (2) below.

---

[1] Taqbaylit (also called Kabyle) is a Berber language and belongs to the Afroasiatic family. It is mostly spoken in North Algeria, more specifically in Kabylia.

[2] Our data stems from original fieldwork with Taqbaylit native speakers in Algeria.

[3] Abbreviations: aor = aorist; fut = future; int = intensive; dir = directionnal clitic; s = singular; p = plural; m = masculin; f = feminine; len = lenition, L = liquid, V = vowel, C = consonant, # = initial or final position.

(2)	/r/	/l/
a. LV[a]	/r/ > [a] /farn/ > [fan] "sort out.aor"	/l/ > [r] /qla/ > [qra] "fry.aor"
b. aLV/#	/ar/ > [a] /aħənʒar/ > [aħənʒa] "the kid.ms"	/al/ > [ar] /aʃəmlal/ > [aʃəmrar] "the white.ms"
c. LV[i,u]	/rV/ > [rV] /ifri/ > [ifri] "cave" /!azru/ > [!azru] "stone"	/lV/ > [rV] /zli/ > [zri] "spin.aor"
d. aLV	/arV/ > [arV] /ssʃar/ > [ssʃa]/[ssʃara] "get drunk.aor/int"	/alV/ > [arV] /aʃəmlal-a/ > [aʃəmrar-a] "this white one"
e. LL	/rr/ > [rr] /farn/ > [fan]/[farrən] "sort out.aor/int"	/ll/ > [ddʒ] /xləq/ > [xrəq]/[xəd͡ʒəq] "born.aor/int"
f. Lθ	/r+θ/ > [θ] /θaħənʒaθ/ > [θaħənʒaθ] "the kid.fs" /!ndar-θ/ > [!nda-θ] "throw-2p"	/l +θ/ > [tʃ] /θaʃəmlalθ/ > [θaʃəmrat͡ʃ] "the white.fs"

As we can see in the table in (2), /l/ never surfaces as [l] in Ath-Sidar Tarifit. By contrast, in standard Taqbaylit, the liquid /l/ is always realized as [l] in all positions, and in the Taqbaylit varieties of Ouadhia and Chemini, /l/ can be realized as [j] or [ɹ], respectively. In fact, the Taqbaylit varieties under scrutiny here show a clear alternation: while the surface variants of /l/ appear in the same environments in both varieties, the precise realization of /l/ depends on the environment. /l/ surfaces either as [l] or the glide [j] in Ouadhia, whereas it is realized as [l] or the rhotic [ɹ] in Chemini. Realizations of /l/ as [j] and as [ɹ] are exemplified in (3) below.

(3)	**StT**	**OuT**	**ChT**	**Gloss**
a. VLV	[ali]	[aji]	[aɹi]	"to climb.aor"
b. CLV	[məbla]	[məbja]	[məbɹa]	"whithout"
c. L#	[ul]	[uj]	[uɹ]	"heart"

In the geminate context, in Ouadhia and Chemini, /l/ surfaces only as [ll], as illustrated in (4). In order to form the intensive verbal theme in Taqbaylit, the second consonant of the root is geminated. In the examples, the geminated /l/ surfaces in all the varieties.

(4)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√ðl	[ðlu]/[ðəllu]	[ðju]/[ðəllu]	[ðɹu]/[ðəllu]	"to visit.aor/int"
b.	√hlç	[hləç]/[həlləç]	[hjəç]/[həlləç]	[hɹəç]/[həlləç]	"to be sick.aor/int"
c.	√βlʕ	[βləʕ]/[βəlləʕ]	[βjəʕ]/[βəlləʕ]	[βɹəʕ]/[βəlləʕ]	"to be eaten.aor/int"

3. Theoretical framework and proposal

Our analysis is couched within the CV framework (Guerssel 1992, Lowenstamm 1996) and uses Element Theory (Backley 2011; Harris 1990; Kaye, Lowenstamm & Vergnaud 1985, 1990; Scheer 1996) for subsegmental representations. In our paper, we follow the version of Element Theory proposed by Backley (2011, 2012) who uses a set of six elements (or monovalent primes). These elements are divided into two groups: vocalic elements and consonantal elements. The vocalic elements - |I|, |A| and |U| - can be directly interpreted as the cardinal vowels [i], [a], [u]. They can also combine to form other vowels. These elements are also used to describe the place of consonants. The set of six elements and their related interpretations are summarized in (5).

(5) **Vowel Elements (Place Elements)**
   |A| pharyngeals, coronals, liquids, non-high vowels
   |U| labials, velars, uvulars, rounded vowels
   |I| palatals, coronals, front vowels
   Consonant Elements (Manner Elements)
   |L| fully voiced obstruents, low tone vowels
   |H| voiceless obstruents, high tone vowels
   |ʔ| oral/nasal/glottal stops, laryngealized vowels

<div align="right">(Backley 2012: 16)</div>

We propose that the lenition of /l/ and its realizations in Ouadhia and Chemini are the result of three factors. The first factor is the bipositionality of /l/. /l/ must have access to two consonantal positions to surface in its underlying form, otherwise it will weaken to [j] or [ɹ]. The second factor is that the surface forms are the result of the elementary content of /l/. The surface realizations [j] and [ɹ] are expected if the internal structure of /l/ minimally contains the |I| and |A| elements. The third factor is that lenition is a consequence of the relationships contracted with adjacent segments. The internal makeup of adjacent segments can block lenition, particularly in the case of /l/ being adjacent to /t/ and /d/.

In the following sections, we first discuss the internal structure of /l/, then we turn to its bipositionality and its peculiar interaction with the coronal stops /t/ and /d/. Before concluding, we will address the presence of the stop-element |ʔ| in /l/.

4. Realizations of /l/

4.1 Environments

We now turn to the data from Standard, Ouadhia and Chemini Taqbaylit in detail. The data in (6) are organized with respect to the position where /l/ appears.

(6)	StT	OuT	ChT	Gloss
a. VLV	[ali]	[aji]	[aɹi]	"to climb.aor"
	[ulawən]	[ujawən]	[uɹawən]	"heart.p"
	[ilili]	[ijiji]	[iɹiɹi]	"laurel"
b. CLV	[ðlu]	[ðju]	[ðɹu]	"to visit.aor"
c. VLC	[ilsawən]	[ijsawən]	[iɹsawən]	"tongue.p"
d. #L	[lsas]	[jsas]	[ɹsas]	"base, foundation"
e. L#	[ul]	[uj]	[uɹ]	"heart"

In all the cases in (6), the lateral of the standard Taqbaylit is realized as [j] and [ɹ] in Ouadhia and Chemini respectively. In (6.a), in the intervocalic position, irrespective of the quality of the vowels surrounding /l/, the allophones [j] and [ɹ] appear. We observe the same alternations in the post-consonantal position (CLV in (6.b)) and in the pre-consonantal position (VLC in (6.c)). The same observation holds true in initial context (6.d) and in final context (6.e).

We conclude that the environment does not seem to play any role on these realizations in Ouadhia and Chemini. However, as we will see later, this is not always the case.

4.2. Internal content

In (7), we present the representations we adopt. The data in (6) suggest that the liquid is made up of at least two elements, |A| and |I|. Following Backley (2011), we assume that the glide [j] corresponds to |I| in a consonant or Onset position, while the consonant [ɹ] of the Chemini variety corresponds to an |A| in this position.

(7)   **a. StT**   **b. OuT**   **c. ChT**
         /l/   /l/   /l/
          | | |
         |A| |A| |A|
         |I| |I| |I|

         [l]   [j]   [ɹ]

Our hypothesis is that the representation of /l/ contains at minimum |A| and |I| in standard Taqbaylit. This content is reduced to |I| in Ouadhia, hence the [j] realization, and to |A| in Chemini, hence the [ɹ] realization. In other words, lenition in these languages is the result of the loss of a place element (cf. Harris 1990). In (7), we have represented the element lost through lenition in grey.

In the next sections, we will show that in Chemini and Ouadhia there are two environments where /l/ still surfaces. The first environment is when it geminates while the second is related to the presence of the coronal stops after /l/.

4.3. Gemination of /l/

4.3.1. Two types of gemination

Gemination in Taqbaylit is either a lexical property of a word or it is derived through propagation of a root consonant or assimilation at the post-lexical level. Whatever the type of gemination (lexical or derived), the lateral always surfaces as [l].

First we present the case of derived gemination. We have already seen the case of intensive verb forms in (4) repeated here in (8) for convenience.

(8)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√ðl	[ðlu]/[ðəllu]	[ðju]/[ðəllu]	[ðɹu]/[ðəllu]	"to visit.aor/int"
b.	√hlç	[hləç]/[həlləç]	[hjəç]/[həlləç]	[hɹəç]/[həlləç]	"to be sick.aor/int"
c.	√βlʕ	[βləʕ]/[βəlləʕ]	[βjəʕ]/[βəlləʕ]	[βɹəʕ]/[βəlləʕ]	"to be eaten.aor/int"

The data in (9) show that an underlying /j/, when it geminates, surfaces as [gg] in all varieties. This is important for the Ouadhia variety: when comparing (8) and (9) we can establish the presence of an underlying /l/.

(9)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√ʕj	[ʕju]/[ʕəggu]	[ʕju]/[ʕəggu]	[ʕju]/[ʕəggu]	"to be tired.aor/int"
b.	√ʕjð	[ləʕjað]/[aʕəggəð]	[ləʕjað]/[aʕəggəð]	[ləʕjað]/[aʕəggəð]	"shout"

Examples of the second case of gemination, which we call "lexical gemination", are given in (10). In these forms, the lateral is underlyingly a geminate: it is not derived and it does not undergo lenition.

(10)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√lẓ	[llaẓ]	[llaẓ]	[llaẓ]	"to be hungry.aor"
b.	√ln	[allən]	[allən]	[allən]	"eyes"
c.	√ml	[aməllal]	[aməllaj]	[aməllaɹ]	"white"

In this section, we have seen that the lateral always surfaces as a full lateral when it is a lexical or derived geminate. In the following section, we will discuss the bipositionality of /l/.

4.3.2. Bipositionality

Our explanation of the facts in (10) is stated in (11).

(11) For the lateral to surface as [l] in Ouadhia and Chemini, it must be associated to two consonant positions.

The condition in (11) is formally represented in (12) using the CV framework with elements.

(12)	a. simple	b. geminate
Ouadhia	C V | |I| [j]	C V C V ＼／ |I| [l]
Chemini	C V | |A| [ɹ]	C V C V ＼／ |A| [l]

The representations in (12) only make use of the elements |A| and |I| for which we have argued for up to now. In order to specify the internal content of /l/ further, we need to consider a last set of data.

4.4. /l/ preceding /t, d/

There is a particular environment where the lateral surfaces as [l]: when it precedes the coronal stops /t/ and /d/. This is exemplified in (13).

(13)		**StT**	**OuT**		**ChT**		**Gloss**
a.	√ltf	[ltəf]	[ltəf]	*[jtəf]	[ltəf]	*[ɹtəf]	"to massage.aor"
b.	√ltf	[altaf]	[altaf]	*[ajtaf]	[altaf]	*[aɹtaf]	"massage"
c.	√ldn	[aldun]	[aldun]	*[ajdun]	[aldun]	*[aɹdun]	"lead"
d.	√ld	[ldi]	[ldi]	*[jdi]	[ldi]	*[ɹdi]	"to open.aor"

We would expect the lenition of /l/ above, as in the examples in (6); however, the lateral surfaces as an [l], and it does not appear to be geminated. We must further note, however, that this phenomenon is order-sensitive. As the data in (14) show, whenever the liquid follows the coronal stop, lenition occurs and we obtain the expected result [j] and [ɹ].

(14)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√tlf	[tləf]	[θjəf]	[tɹəf]	"to perish, expire.aor"
b.	√fθl	[fəttl-ən]	[fəttj-ən]	[fəttɹ-ən]	"to roll the couscous-3mp.aor"
c.	d+l	[a d-laʕi-n]	[a d-jaʕi-n]	[a d-ɹaʕi-n]	"fut dir-to call-3mp"
d.	√βðl	[βəddl-ən]	[βəddj-ən]	[βəddɹ-ən]	"to change-3mp.aor"

The generalization that we can establish from the data in (13) and (14) is given in (15).

(15)   [l]{t,d}   but   *{t,d}[l]

By contrast, /l/ does undergo lenition before the other coronals, for example /s/ or /n/. As informally stated in (16), when the lateral precedes these segments, lenition occurs and [j]/[ɹ] are realized in Ouadhia and Chemini.

(16)   /l/{s, n}   >   [j]ₒᵤₜ, [ɹ]cₕₜ {s, n}

The data in (17a-b) show some examples of the lenition of /l/ before /s/ and /n/, and the data in (17c-d) show this lenition after /s/ and /n/.

(17)		**StT**	**OuT**	**ChT**	**Gloss**
a.	√ls	[ilsaw-ən]	[ijsaw-ən]	[iɹsaw-ən]	"tongue-p"
b.	√sln	[θiseln-in]	[θisejn-in]	[θiseɹn-in]	"ash tree-p"
c.	√sl	[sla-n]	[sja-n]	[sɹa-n]	"to hear-3mp.pret"
d.	√lʕ	[n-luʕa]	[n-juʕa]	[n-ɹuʕa]	"3mp-to call.pret"

We aim to unify the cases where lenition is blocked: i) before /t/ and /d/ and ii) when gemination occurs (8). We propose that in both cases /l/ is branching. This implies that /t/ and /d/ differ from other coronals in that they do not bear any place content (Scheer 1998). This position is also taken in some proposals couched within Feature Geometry (e.g Paradis & Prunet 1991: 428 "*Coronals, as the unmarked consonants, are represented underlyingly without a place node*"). If the consonant that follows /l/ is devoid of place element, /l/ can branch and there is no lenition (this is represented in (18.a)). If the consonant that follows /l/ contains a place element, /l/ cannot branch and lenition

occurs (this is represented in (18.b)). In the representations below, the element |E| stands for any place element.

(18)	a. right branching	b. blocked branching
Ouadhia	C V C V	C V C V
	|I| | |	|I| |E|
	[l] [t]	[j] [s]
Chemini	C V C V	C V C V
	|A| | |	|A| |E|
	[l] [t]	[ɹ] [s]

5. Generalization

In order to fully understand the lenition process and the segmental specification of /l/, we need to address two morpho-phonological processes to fully understand the internal elemental content of /l/: i) feminine formation and ii) occlusivization of fricatives.

5.1 Proposal

The triggering of the lenition process relies on the consonantal environment and on the availability of an accessible skeletal position. In (19) we sum up the distribution of lenition. (with a "+" signifying that lenition takes place, and "-" signifying that lenition is blocked).

(19)	intervocalic onset post-coda onset	coda, initial and final position	
		__{t/d}	__{¬t, ¬d}
singleton	+	-	+
geminated	-	-	-

Following this distribution, (20) further specifies the makeup and behavior of /l/ in Ouadhia and Chemini.

(20)   i) beside the elements |I|/|A|, /l/ also bears the occlusion element |ʔ|;
        ii) for [l] to surface fully, it must:
                (a) be associated with two consonant positions;
            and (b) branch to the right (Lowenstamm 1996, Bendjaballah 2017).

(21)	Alternance		Propagation	
	a. single	b. geminated	c. right branching	d. blocked
Ouadhia	C V | |I| |ʔ| [j]	C V C V ∨ |I| |ʔ| [l]	C V C V ⌐---▶| |I| | | |ʔ| |ʔ| [l] [t]	C V C V ⌐-X-▶| |I| |E| [j] [s]
Chemini	C V | |A| |ʔ| [ɹ]	C V C V ∨ |A| |ʔ| [l]	C V C V ⌐---▶| |A| | | |ʔ| |ʔ| [l] [t]	C V C V ⌐-X-▶| |A| |E| [ɹ] [s]

If the conditions in (20.ii) are not met, if /l/ is not associated with two positions or if it does not branch to the right, then part of its content is lost and the allophones surface as in (21.a). If /l/ can spread to two positions, as in (21.b), it is geminated, and /l/ can surface as [l]. The reason why /l/ surfaces before /t, d/, and exclusively before /t, d/, is due to the fact that /t/ and /d/ do not bear a place element in Taqbaylit. Scheer (1998: 150) proposes that "*[t, d] have no melodic substance: no melodic element (I, U, A) contributes to their articulation. Two types of reasons can lead to the belief that [t, d] are nothing: 1) markedness considerations, and 2) the epenthetic status of [t, d]*"[4]. For the first argument, he postulates that [t,d] are present in the inventory of most of the world's languages (see Narty 1979, Maddieson 1984, Pagliano 2003). Among the coronals, [t, d] are unmarked among all others consonants (see Paradis & Prunet 1991). Scheer (1998: 150) postulates the presence of the empty element |v|[5] (following Kaye, Lowenstamm & Vergnaud 1985) in the representation of [t, d], given in (22).

(22) |v|
         |h|
         |ʔ|

         [t,d]   (Scheer 1998:151)

An argument in favor of the idea that these consonants are empty is the existence of epenthetic [t, d] in French. In French, a hiatus between two words as a result of morphology is solved by inserting a [t], as illustrated in (23).

(23)   /a il dit/   >   a-**t**-il dit "said he "
        /verra on/   >   verra-**t**-on "will we see"   (Scheer 1998: 151)

The same phenomena exist between two morphemes of the same word, see (24).

---

[4] Scheer (1998: 150) " *[t, d] n'aient pas de substance mélodique : aucun élément mélodique (I, U, A) ne contribue à leur articulation. Deux types de raisons peuvent amener à croire que [t, d] ne sont rien : 1) des considérations de marque, et 2) le statut épenthétique de [t, d].*".
[5] |v| has been discarded in the recent literature on Element Theory. However, we retain Scheer's proposal that coronals under scrutiny are empty.

(24)   a. epenthetic [t]
       /bijou + ier/   >   bijou**t**ier "jeweller"
       b. epenthetic [d]
       /Marivaux + er/   >   marivau**d**er "to write like Marivaux"

Assuming that the representation of Scheer given in (22) is correct, the following analysis applies in Taqbaylit: if the consonant following /l/ has no place element |A, I, U|, /l/ can branch to its right and there is no lenition (as in (21.c)). However, if the following consonant has any place element, /l/ cannot branch and lenition occurs (as in (21.d)).

5.2. Why does /l/ have the occlusion element |ʔ|?

The addition of the occlusion element |ʔ| in the lateral, as already proposed in Harris (1990) and Uflsbjorninn & Lahrouchi (2016), is an assumption which can be motivated by two phenomena: i) the formation of the feminine, and ii) the occlusivization of fricatives.

5.2.1. The formation of the feminine

The derivation of the feminine consists of the circumfixation of /θ- -θ/ to a masculine nominal base. This is exemplified in (25).

(25)	**StT**	**OuT**	**ChT**	**Gloss**
a. √mʃ	[amʃiʃ]/[θ-amʃiʃ-θ]	[amʃiʃ]/[θ-amʃiʃ-θ]	[amʃiʃ]/[θ-amʃiʃ-θ]	"cat.ms/.fs"
b. √fns	[afunas]/[θ-afunas-θ]	[afunas]/[θ-afunas-θ]	[afunas]/[θ-afunas-θ]	"bull.ms/.fs"
c. √jðr	[ijiðər]/[θ-ijiðər-θ]	[ijiðər]/[θ-ijiðər-θ]	[ijiðər]/[θ-ijiðər-θ]	"eagle.ms/.fs"
d. √ɣjl	[aɣjul]/[θ-aɣjul-**t**]	[aɣjuj]/[θ-aɣjul-**t**]	[aɣjuɹ]/[θ-aɣjul-**t**]	"donkey.ms/.fs"
e. √lɣm	[alɣəm]/[θ-alɣə**m-t**]	[ajɣəm]/[θ-ajɣə**m-t**]	[aɾɣəm]/[θ-aɾɣə**m-t**]	"camel.ms/.fs"
f. √qjn	[aqʒun]/[θ-aqʒu**n-t**]	[aqʒun]/[θ-aqʒu**n-t**]	[aqʒun]/[θ-aqʒu**n-t**]	"dog.ms/.fs"

We observe that the sonorants /l, m, n/ at the end of the masculine nominal base trigger the hardening of the suffixal fricative (Chaker 1983, Nait-Zerrad 2001). We propose that this is due to the presence of the occlusion element in the internal content of /l/. The relevant examples are given in (25.d-f). This occlusivization does not happen with the sonorant /r/ (in 25.c), which does not contain the occlusion element.

We give in (26) the representations for the sequences /l, m, n/ + /θ/ in StT which show the propagation (represented by the arrow) of the occlusion element |ʔ| on the following fricative.

(26) /n, m, l/ + /θ/ in StT

	a.	/n/	/θ/	**b.**	/m/	/θ/	**c.**	/l/	/θ/
		|A|~|I|	| |		|U|	| |		|A|	| |
		|L|	|H|		|L|	|H|		|I|	|H|
		|ʔ|------▶ |ʔ|		|ʔ|------▶ |ʔ|		|ʔ|------▶ |ʔ|
		[nt]			[mt]			[lt]	

This occlusion element |ʔ| is absent from the interdental fricative /θ/, and it is acquired when /θ/ is in contact with the sonorants /l, m, n/. The result of propagation is the occlusivization of /θ/ to [t].

We give in (27) the sequence /l/ + /θ/ in Standard Taqbaylit, Ouadhia and Chemini, where /θ/ undergoes occlusivization which leads to [t]:

(27) /l/ + /θ/ in StT, OuT and ChT

	a. **Standard Taqbaylit**	b. **Ouadhia**	c. **Chemini**
	/l/ /θ/	/l/ /θ/	/l/ /θ/
	|A| | |	|I| | |	|A| | |
	|I| |H|	|H|	|H|
	|ʔ|- - -▶|ʔ|	|ʔ|- - -▶|ʔ|	|ʔ|- - -▶|ʔ|
	[lt]	[lt]	[lt]

The data in (25) associated with their representations in (26) and in (27), allow us to justify the addition of the occlusion element |ʔ| in the internal structure of /l/ in Taqbaylit. As a matter of fact, without this additional element, the initial representation cannot explain the occlusivization of the feminine suffixe when it encounters the lateral.

We have represented the fricative /θ/ in (26) and (27) without place elements based on its behavior. Indeed, when it geminates it is realized as [tt]. Further on from Scheer's (1998: 151) representation of /t/ without a place element, we claim that /θ/ does not have one either. In addition, /t/ and /s/ do not have the same behavior in Taqbaylit. /s/ is realized as the affricate [ts] when it geminates. This is illustrated in (28).

(28) | | | **All varieties of Taqbaylit** | | **Gloss** |
|---|---|---|---|---|
| a. | √fθl | [fθəl] | [fəttəl] | "to roll the couscous.aor/int" |
| b. | √xsr | [xsər] | [xəttˢər] | "to damage.aor/int" |

Based on Taqbaylit data, /θ/ contains only the element |H|. When it geminates it acquires the occlusion element |ʔ|. The result |H ʔ| corresponds to the elements of /t/ according to Scheer (1998: 151).

5.2.2. Gemination and occlusivization of fricatives

The second case which shows the presence of the occlusion element is the occlusivization of fricatives when they geminate. The examples in (29) show the change from the aorist to the intensive in verb forms. In this formation, the second consonant of the root is geminated and this is the case in all varieties of Taqbaylit.

(29) | | | **All varieties of Taqbaylit** | | **Gloss** |
|---|---|---|---|---|
| a. | √ xðm | [xðəm] | [xəddəm] | "to work.aor/int'" |
| b. | √fθl | [fθəl] | [fəttəl] | "to roll the couscous.aor/int" |
| c. | √rβ | [r̩βu] | [r̩əbbu] | "to hide.aor/int" |
| d. | √βð | [βðu] | [βəddu] | "to begin.aor/int" |

We give in (30) the CV representation of the data in (29.a).

(30) √xðm: a. *aorist*   b. *intensive*

```
        C   V   C   V   C   V           C   V   C   V   C   V   C   V
        |       |   |   |               |   |        \ /        |   |
        x       ð   ə   m               x   ə        d      ə   m
```

In the intensive, the geminated fricative occupies two skeletal positions and, in this case, the occlusion element |ʔ| is inserted. This is systematic and it always results in the occlusivization of the fricative (Dell & Elmedlaoui 1997). These data in (29) and (30) lead us to conclude that the element |ʔ| is a by-product of this double association. This configuration is responsible for the occlusivization of the feminine suffix (25d-f) and it entails the gemination of /l/ (8). There is a strong correlation in Taqbaylit between the presence of the occlusion element and the association to two positions (as proposed in Jensen 1994 for Pulaar). That is the reason why /l/ surfaces in Ouadhia and Chemini as [l] only where it has the opportunity to branch on an adjacent position to its right.

Conclusion

To conclude, we have provided a representational account that explains the behavior of /l/ in Taqbaylit Berber. The presence of |A| and |I| in the internal make up of /l/ in standard Taqbaylit is expected in Element Theory framework (Backley 2011). This explains the surface realizations of /l/ as [j] and [ɹ] in Ouadhia and Chemini respectively. We have shown that the surfacing of [l] relies on the number of positions and linear order.
The behavior of the liquid in Taqbaylit allowed us to represent its syllabic structure as follows: i) when /l/ is unipositional, it is subject to lenition and in this case it is the variants [j] and [ɹ] that surface in Ouadhia and Chemini respectively; ii) when it is bipositional, in the cases of gemination and right-hand branching on [t, d], it is [l] which surfaces in all these varieties of Taqbaylit. Element structure of other segments in Taqbaylit will be explored further in forthcoming work.

Acknowledgements

References

Backley, P. (2011). An introduction to Element Theory. Edinburgh University Press.
Backley, P. (2012). Variations in Elements Theory. Linguistic Variation 12 (1): 57-102.
Bendjaballah, S. (2017). Gutturals and glides, and their effects on the Mehri verb. Linguistic Studies in the Arabian Gulf. Quaderni di Ricognizioni III: 13-36.
Chaker, S. (1983). Un parler berbère d'Algérie (Kabyle): Syntaxe. Université de Provence, Aix-en-Provence.
Dell, F. & M. Elmedlaoui. (1997). Les géminées en berbère. Linguistique africaine, (19), 5-55.
Dell, F. & O. Tangi. (1993). On the vocalization of /r/ Ath-Sidhar Rifian Berber", Linguistica

Communicatio 5: 5-53.

Guerssel, M. (1992). The phonology of Berber derivational morphology by affixation. Linguistic Analysis 22: 3-60.

Harris, J. (1990). Segmental complexity in phonological government. Phonology 7: 255-300.

Jensen, S. (1994). Is ʔ an element? Towards a Non-segmental Phonology. SOAS Working Papers in Linguistics and Phonetics 4, 71-78

Kaye, J. D. & J. Lowenstamm & J. R. Vergnaud. (1985). The internal of phonological elements: a theory of charm and government. Phonolgy 2: 305-328.

Kaye, J. D. & J. Lowenstamm & J. R. Vergnaud. (1990). Constituent structure and government phonology. Phonology 7: 193-231.

Lowenstamm, J. (1996). CVCV is the only syllable type. Current trends in Phonology. Models and Methods, edited by Jacques Durand et Bernard Laks: 419-441.

Nait-Zerrad, K. (2001). Grammaire moderne du Kabyle. Editions Karthala.

Nartey, J. N. A. (1979). A study in phonemic universals: especially concerning frictives and stops (Vol. 46). University of California, Los Angeles.

Maddieson, I. (1984) Patterns of sounds, Cambridge.

Pagliano, C. (2003). L'épenthèse consonantique en français. Ce que la syntaxe, la sémantique et la morphologie peuvent faire à la phonologie : parles-en de ta numérotation ?impossible. Ph.D dissertation, Université de Nice.

Paradis, C. & J. F. Prunet. (1991). Coronal or velar placeless consonants?. WCCFL vol. 9: 427-441.

Scheer, T. (1996). Une théorie de l'interaction directe entre consonnes : contribution au modèle syllabique CVCV. Alternances e-ø dans les préfixes tchèques, structure interne des consonnes et la théorie X-barre en phonologie. Doctoral dissertation. Université Paris 7.

Scheer, T. (1998). La structure interne des consonnes. Langues et Grammaire II-III, Phonology. Edited by Patrick Sauzet: 140-172.

Tangi, O. (1991). Aspects de la phonologie d'un parler berbère du Maroc: Ath-Sdhar (Rif). Doctoral dissertation, Paris 8.

Uflsbjorninn, S. & M. Lahrouchi. (2016). The typology of the distribution of Edge: The propensity for bipositionality. Papers in Historical Phonology 1: 109-129.