Aramaic & Hebrew Metathesis

Emmanuel Aïm
University Paris 7 & University of Orléans
emmanuel.aim@linguist.jussieu.fr

Abstact
The aim of this paper is to offer an analysis of the well-known metathesis process of the sibilant+dental stops clusters in the reflexive/passive verbal forms of Ancient Aramaic and Ancient Hebrew, e.g. :

(1) Aramaic / ʔi**t + s**əʕar / > ʔi**st**əʕar *ʔi**ts**əʕar "he has been visited"

This process will not be considered as a proper feature of Aramaic and Hebrew: it will be integrated into the more general discussion on extrasyllabicity and on special status of the coronal obstruents at word edges.

1. Introduction

1.1. Extrasyllabicity

It is notorious that the coronal obstruents at the margin of words have a special status. Languages like English and German exhibit constraints on word-initial and word-final consonantal clusters: they must respectively display increasing sonority and decreasing sonority. However exceptions occur when the initial consonant or the final consonant is a coronal obstruent. Let's consider for example the case of English. The relevant word-initial constraints are given in (2). Word-initial onsets must have maximaly two consonants (2a), must display rising sonority (2b), the second consonant cannot be nasal (2c) and finaly coronal consonants are never followed by *l* (2d)

(2) English word-initial onsets

a.	CC maximaly	**pl**aque
b.	rising sonority	**dr**um
c.	*Cn, *Cm	***fn**…, ***fm**...
d.	*coronal+l	***dl**…

However, some clusters systematicaly violate these constraints. They have three consonants (3a), they don't display rising sonority (3b), the second consonant is a nasal (3c), they exhibit a coronal followed by *l* (3d).

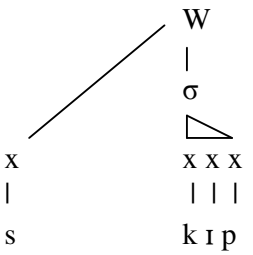
(3)

a.	CCC	**scr**eam[1]
b.	decreasing sonority	**st**em
c.	Cn, Cm	**sn**ow, **sm**ell
d.	coronal+l	**sl**ide

Phonological studies traditionaly account for the special feature of initial *s* by a particular apparatus: appendix (Fudge 1969), extrasyllabicity (Kenstowicz 1994), coda preceded by an empty onset (Kaye 1992), and so on. The more current, extrasyllabicity, is given in (4): the *s* doesn't belong to any syllable. However, since it is a constitutive element of the word, it is directly linked to it.

[1] In the context #_r , *s* surfaces as *š*, e.g. [šred] *shred.*

(4)



Let's consider now the English word-final clusters restrictions. The relevant word-final constraints are given in (5). Word-final clusters must have maximaly two consonants (5a), and must display decreasing sonority (5b).

(5) English word-final clusters

a.	CC maximaly	he**mp**
b.	decreasing sonority	e**lf**

However, some clusters systematicaly violate these constraints. They have three consonants (6a), they don't display decreasing sonority (6b) or they violate both length and sonority constraints (6c).

(6)

a.	CCC	[wa**yld**]	wild
		[pe**ynt**]	paint[2]
b.	*decreasing sonority	[æ**ps**]	apse
		[æ**dz**]	adze
		a**ct**	
c.	CCC+*decreasing sonority	[sɪ**ksθ**]	sixth
		[sɪ**ksθs**]	sixths

Each of these clusters end with one or more coronal obstruent, that is *s, z, t, d, θ*. The treatment of these final consonants is broadly the same as the initial s: appendix, extrasyllabicity, onset followed by an empty nucleus, and so on.

As shown in (7), the differences between word-initial extrasyllabicity and word-final extrasyllabicity are small. The main differences are <u>firstly</u> that the class of final extrasyllabic segments is more important including both coronal fricatives and stops, and <u>secondly</u> that final coronals can be flexional morphemes.

(7) a.

#	s	C(C)		(C)C	s	#
#	š	C(C)		(C)C	z	#
				(C)C	t	#
				(C)C	d	#
				(C)C	θ	#

b. monomorphemic word segment (**s**now) — monomorphemic word segment (pain**t**); morpheme (dog-**s**)

1.2. Another look at extrasyllabicity

Another look at extrasyllabity has been recently proposed by Lowenstamm 2002. This reanalysis belongs to a wider theory in which the syllable structure is viewed as a strict alternation of C and V

[2] Whether the glide must be treated as a part of the nucleus or as a part of the coda is another question.

slots. Within this frame, the representations of an open light syllable, a long vowel, a closed syllable and a geminate are given in (8).

(8) a. C V b. C V C V c. C V C V d. C V C V C V

| | | \ / | | | | \ / |

d a [da] d a [daa] d a k [dak] d a k a [dakka]

Let's return to extrasyllabicity. The word-initial consonant *s* is represented as the propagation of a lexical segment on an initial CV-site located on the left word-edge of every major lexical category (for independent arguments supporting the existence of an initial CV-site, see Lowenstamm 1999, 2003). For instance, the representation of the french word [spɔr] "sport" is given in (9a), where the initial CV-site is in bold, while the representation of the french word [pɔr] "port" is given in (9b).

(9) a. **CV** - CVCV b. **CV** - CVCV

| | | |

s p ɔ r p ɔ r

The fundamental distinction between the traditional approach and Lowenstamm's one is the following. In the traditional view, the extrasyllabic slot or appendix is generaly only required in languages like English, German and French. In Lowenstamm's approach, the presence of the initial CV-site is assumed in **all** languages. Thus a question arises:

if the initial site is the seat of a segmental restriction in languages like English, German, etc, why wouldn't it be also the case in other languages?

Here, a precision is needed : the segmental restriction on the initial CV-site in English, German and French is a restriction that arises mainly during the formation of monomorphemic words in the lexicon. This restriction doesn't appear during other processes, like prefixation, reduplication or clitisization. For exemple, the French initial CV-site hosts non coronal obstruents like *l, m, v*, during clitisization, as illustrated in (10):

(10) **CV**-CVCV **CV**-CVCV **CV**-CVCV

| | | | | | | | | | |

l a ʃ ɛ z ma ʃ ɛ z v o ʃ ɛ z

[laʃɛz] [maʃɛz] [voʃɛz]

"the chair" "my chair" "your chairs"

Nevertheless, if a restriction on the type of consonants allowed in the initial CV is lexicaly determined in some languages, it is not excluded that a similar or a different restriction can at once exist and be morphologicaly determined in other languages. In other words, we would expect a language to perform a selection of a subset of segments during their association to the initial CV-site. Regarding this subset of segments, we of course expect it to constitute a natural class of sounds. So, the logical possibilities are manifold : glide, nasal, lateral, labial, velar and so forth. If we want to get closer to extrasyllabicty facts, two hypothesis are possible. First, the subset is the same as the word-initial subset: it only includes coronal fricatives. Secondly, the subset is identical to the word-final subset: it only includes the coronal obstuents, fricatives and stops at once. The aim of this paper is precisely to show i) that Aramaic and Hebrew exhibit a selection between the

coronal obstruents (fricatives and stops at once) and the other consonants during the derivation of the reflexive/passive verbal forms ii) that this selection can explain the metathesis that occurs in this verbal forms.

2. The facts

2.1. Aramaic & Hebrew verbal systems

The Ancient Aramaic verbal system is given in (11). Each active stem has a reflexive/passive form.The reflexive/passive stems are discerned from their active counterparts by the presence of the prefix *hit-, ʔit-* or *ʔet-* (according to the dialects) and ablaut[3].

(11) Aramaic

	active	*passive/reflexive*
Basic	pəʕal	**ʔetpəʕel**
Factitive/Intensive	paʕʕel	**ʔetpaʕʕal / ʔetpaʕʕeel**
Causative	ʔapʕel	ʔettapʕal [4]

In Hebrew, as shown in (12, 13), the stem that is caracterized by the prefix *hit-* only exists as the reflexive/passive form of the *piʕʕel* stem. Note that Mishnaic Hebrew exhibits an alternative form with *nit-* instead of *hit-* in the perfective conjugation. The presence of *n* is traditionaly explained as an analogical formation from the *nifal* stem (cf. Wright 1890, Segal 1927, Bar-Asher 1999). For my part, I have nothing to say about it.

(12) Biblical Hebrew

	active	*passive*	*reflexive*
Basic	paaʕal	nipʕal----------	nipʕal
Intensive	piʕʕeel	puʕʕal	**hitpaʕʕeel**
Causative	hipʕiil	hopʕal	-

(13) Mishnaic Hebrew

	active	*passive/reflexive*
Basic	paaʕal	nipʕal
Intensive	piʕʕeel	**nitpaʕʕeel ~ hitpaʕʕeel** [5]
Causative	hipʕiil	hupʕal

The verbal stems in which sibilant metathesis occurs are in bold in (11, 12, 13).

2.2. Metathesis & assimilation.

Let's start with the forms that present a fricative coronal as first radical consonant. Consider the data in (14)[6]. With roots beginning with *s, š, ś, z* and *ṣ* there regularly is metahesis of this consonant and the *t* of the prefix. As shown in (14b), a further voicing assimilation of *t* takes place with roots

[3] In (11), (12) and (13) the meaning of each pattern given is mere indication.

[4] Internal causative passive *hu/opʕal* is attested in Biblical Aramaic instead of the more recent *ʔettapʕal*.

[5] The vocalisation *nitpaʕʕ**a**l / hitpaʕʕ**a**l* also occurs.

[6] The next data of Ancient Aramaic will be abstracted from Onqelos and Jonathan Targums' Judeo-Palestinian Aramaic but they are also valid for Biblical Aramaic, Syro-Palestinian, Samaritan, Syriac, Mandaic and Judeo-Babylonian Aramaic (data from other ancient dialects are scanty). The data of Ancient Hebrew will be abstracted from Biblical and Mishnaic Hebrew without distinction. For reason of place, philological issues as orthographic variants, script problems notably in some Syriac forms, uncommon verbs where metathesis or/and assimilation doesn't occur, etc., will be ignored. I will also disregard the total assimilation of the prefix *t* to any first radical consonant that sometimes occurs in Babylonian, Mandaic, Galilean, Samaritan, in the late period of Syro-Palestinian and sometimes also in Biblical and Misnaic Hebrew. About all these points, see Aïm 2003.

beginning with *z*, and, as shown in (14c), a further emphasis assimilation of *t* takes place with roots beginning with *ṣ*. {Please notice that for Aramaic data, the first form is always the basic reflexive stem *ʔetpəʕel* and the second is the intensive reflexive stem *ʔetpaʕʕa/eel.*}

(14) a.

Aramaic	ʔi**t - s**əʕar	>	ʔi**st**əʕar	"to be visited; to be inflicted upon"
	ʔi**t - s**akkeel	>	ʔi**st**akkeel	"to look at, reflect ; to be/become wise"
	ʔi**t - š**əlee	>	ʔi**št**əlee	"to be abandonned, forgotten"
	ʔi**t - š**aggeeš	>	ʔi**št**aggeeš	"to be confused, perplexed, excited"
Hebrew	hi**t - s**abbeel	>	hi**st**abbeel	"to stuff oneself, grow fat"
	hi**t - ś**akkeer	>	hi**śt**akkeer	"to profit; to deal in"
	hi**t - š**appeel	>	hi**št**appeel	"to be humble, gentle ; to be lazy, indolent"

b.

Aramaic	ʔi**t - z**əraʕ	>	ʔi**zd**əraʕ	"to be sown, to be stocked with seed"
	ʔi**t - z**ayyeen	>	ʔi**zd**ayyeen	"to be equipped, armed"
Hebrew	hi**t - z**ayyeep̄	>	hi**zd**ayyeep̄	"to be falsified, forged"

c.

Aramaic	ʔi**t - ṣ**əlee	>	ʔi**ṣṭ**əlee	"to be moved; to tremble, shake"
	ʔi**t - ṣ**abbaʕ	>	ʔi**ṣṭ**abbaʕ	"to be dipped, immersed; to be soaked"
Hebrew	hi**t - ṣ**addeeq	>	hi**ṣṭ**addeeq	"to justify oneself, excuse oneself"

Let's now consider in (15) the forms with a coronal stop as first radical consonant. As shown in (15a), voicing assimilation of *t* occurs with roots beginning with *d*. As shown in (15b), emphasis assimilation of *t* occurs with roots beginning with *ṭ*.

(15) a.

Aramaic	ʔi**t - d**əħeeq	>	ʔi**dd**əħeeq	"to be pressed, squeeze oneself"
	ʔi**t - d**aheen	>	ʔi**dd**aheen	"to drip, be fat"
Hebrew	hi**t - d**abbeer	>	hi**dd**abbeer	"to hold communion, converse"

b.

Aramaic	ʔi**t - ṭ**əʕan	>	ʔi**ṭṭ**əʕan	"to be laden ; to be carried"
	ʔi**t - ṭ**abbaʕ	>	ʔi**ṭṭ**abbaʕ	"to be sunk"
Hebrew	hi**t - ṭ**ammaa	>	hi**ṭṭ**ammaa	"to be unclean ; to make oneself unclean"

Finally, as shown in (16), whith roots beginning with *t*, the *t* of the prefix does not undergo the spirantization since it constitutes a geminate cluster with the first consonant of the root.

(16)

Aramaic	ʔi**t - t**ənee	>	ʔi**tt**ənee	"to be repeated"
	ʔi**t - t**aggar	>	ʔi**tt**aggar	"to make profit, to be benefited"
Hebrew	hi**t - t**abbeel	>	hi**tt**abbeel	"to be mixed, seasoned ; to defile oneself"

It is **very important** to note :

i) that the metathesis also applies in Aramaic when an epenthetic *i/e* is (optionaly) inserted between the affix *t* and the first radical consonant, e.g. Syriac[7] :

/ʔe**t-š**qel/ > ʔe**šet**qel ~ ʔe**št**əqel "he has extoled himself"

The metathesis *is not* a mere *phonological* process triggered to avoid an illicit sibilant+dental stop cluster: even disjoined by a vowel, the sibilant and the dental change places.

ii) the metathesis doesn't apply outside the reflexive stems, as illustrated in (17):

(17)	*Aramaic*	ne**t**šaṯ	"she has teared off"	*ne**št**aṯ	√ntš
	Hebrew	no**t**šii	"my uprooting"	*no**št**ii	√ntš
	Aramaic	qu**d**šaa	"the sanctity"	*qu**šd**aa	√qdš
	Hebrew	qo**d**šii	"my sanctity"	*qo**šd**ii	√qdš

Obviously, the metathesis *is* a *morphological* process: the succession of any sibilant and any dental stop is not a sufficient condition. To trigger the metathesis, the sibilant must be the first consonant of a root and the dental stop must be the passive/reflexive affix.

3. The analysis

3.1. Preliminary analysis.

Previous works on this facts (Greenberg 1950, Malone 1971) only deal with the sibilants metathesis. Certainly, the assimilation of *t* with the dental stops is considered as another phenomenon. On the contrary, my goal is to link these two processes.

In order to obtain the surface forms with roots beginning with *d* and *ṭ*, only a regressive assimilation is required, as shown in (18) :

(18)	/ hi**t+d**abbeer /	/ hi**t+ṭ**ammaa /
regressive assimil.	hi**dd**abbeer	hi**ṭṭ**ammaa
	[hi**dd**abbeer]	[hi**ṭṭ**ammaa]

In order to obtain the surface forms with roots beginning with *z* and *ṣ*, two rules are required: a metathesis rule and an assimilation rule. According to rules order, the assimilation rule can be regressive, as in (19a) or progessive as in (19b).

(19) a.		b.	
	/ hi**t+z**ayyeep /		/ hi**t+z**ayyeep /
regressive assimil.	hi**d-z**ayyeep	metathesis	hi**z-t**ayyeep
metathesis	hi**z-d**ayyeep	progressive assimil.	hi**z-d**ayyeep
	[hi**zd**ayyeep̄]		[hi**zd**ayyeep̄]

[7] This epenthesis appears in Judeo-Palestinian Aramaic, Syriac and Mandaic. It is not restricted to the passive/reflexive stems but belongs to a wider phonological process (see Stevenson 1924, Bohas 1999, Duval 1881, Nöldeke 1875, Macuch 1965).

At first sight, (19a) seems to be the best solution. Firstly, other assimilations attested in Ancient Aramaic and Ancient Hebrew are generaly regressive. Some examples from Syriac are given in (20).

(20)	/tuu**b**-**ṯ**aanaa/	>	tuu**p̄ṯ**aanaa	"happy"
	/pəšii**ṭ**-**t**aa/	>	pəšii**tt**aa	"simple"
	/ragguu**z**-**ṯ**aanaa/	>	ragguu**sṯ**aanaa	"irascible"
	/ħe**s**daa/	>	ħe**z**daa	"clemency"
	/me**ṯb**ar/	>	me**db**ar	"to break"

Secondly, regressive assimilation is also required with roots beginning with *d* and *ṭ*. Recall previous data in (18).

On the other hand, as pointed out by Bolozky (1997) regarding the same data in Modern Hebrew, the solution (19a) orders a *mere phonetic process*, the assimilation, *before a restricted morpho-phonological one*, the metathesis. So, this order is not desirable and the solution (19b) must be prefered. But a difficulty appears: we need two assimilation processes, one regressive as in (18), an other progressive as in (19b).

However, we can suppose that the forms with roots beginning with *d* and *ṭ* are also obtained with firstly a metathesis rule and secondly a progressive assimilation rule, as shown in (21), since the surface forms obtained are correct.

(21)	/ hi**t+d**abbeer /	/ hi**t+ṭ**ammaa /
metathesis	hi**d-t**abbeer	hi**ṭ-t**ammaa
progressive assimil.	hi**d-d**abbeer	hi**ṭ-ṭ**ammaa
	[hi**dd**abbeer]	[hi**ṭṭ**ammaa]

In the same way, we can suppose that the forms with roots beginning with *t* are obtained with a metathesis rule, as in (22). Note that the idea that coronal stops also undergo metathesis has been previously suggested by Kaufman 1997 and Lipinski 1997[8].

(22)	/ hi**t+t**abbeel /
metathesis	hi**t-t**abbeel
	[hi**tt**abbeel]

The fact that progessive assimilation occurs only there is not a problem, since it is the only assimilation systematicaly noted in scripts. On the contrary, regressive assimilations are just sporadically written. So, we can conclude that the general case is the progressive assimilation, not the regressive one. Therefore, the metathesis implies both coronal fricatives *s, š, ś, ṣ, z* and coronal stops *t, d, ṭ*. The problem now is to understand first of all why the metathesis occurs only in the reflexive/passive stems and secondly why the metathesis implies coronal obstruents only. A brief draft of the answer can be given. As shown in (23), the left margin of the word in the surface forms is always constituted by a subset of segments: the coronal obstruents. Does it mean that the left margin is restricted to a subset of segments ?

[8] Note also that the akkadian reciprocal infix *-t- / -ta-* undergoes metathesis with all coronals, stop and fricative; on this facts, see Aïm 2003: 271-274.

(23)	regular case	(hi)	t	qaṭṭeel
		(hi)	s	tabbeel
		(hi)	š	tappeek
		(hi)	ś	takkeer
	metathesis	(hi)	z	dayyeep̄
		(hi)	ṣ	ṭaddeeq
		(hi)	t	tabbeel
		(hi)	d	dabbeer
		(hi)	ṭ	ṭammaa

I am now going to expose the theoretical framework adopted here. Next, a representation of the reflexive stems and an analysis of the metathesis will be offered.

3.2. Theoretical framework.

I follow in this paper the templatic analysis of Classical Arabic proposed by Guerssel and Lowenstamm 1990. In this frame, all Classical Arabic verbal forms are derived from a single template. This template is given in (24).

(24) **CV** CV **CV** CVCV

The derivation of each verb is performed by the association of segments to specific positions called "head positions". There are two head positions: an initial CV-site and a medial CV-site. These two sites are in bold and underscored in (25). For instance, verbal forms such as *kaatab* (stem III) and *kattab* (stem II) are respectively derived by identification of the medial CV-site by means of Vocalic-spread (25a) and Consonantal-spread (25b).

(25) a.

```
      k a   t a b
      | |   | | |
CV CV CV CVCV
```

kaatab-

b.

```
      k a   t a b
      | |   | | |
CV CV CV CVCV
```

kattab-

As depicted in (26), verbal forms such as *ʔiswadad* (stem IX) and *ʔiftaxar* (stem VIII) are derived by anchorage of the first consonant of the root to the initial CV-site[9].

(26) a.

```
  s w     d
  |     / \
CV CV CV CVCV
```

(ʔi) swadad-

b.

```
  f       x   r
          |   |
CV CV CV CVCV
     |
     t
```

(ʔi) ftaxar-

Regarding the two other reflexive stems, that is stem V *takattab* and stem VI *takaatab*, Guerssel and Lowenstamm argue that these forms are merely obtained by concatenation of the prefix *ta-* to their

[9] Note that Guerssel & Lowenstamm assume that the infix *t-* of *ftaxar* (26b) is a non-derivational (reflexive) feature of the base. Note also that the *ʔ* and the *i* on the left are not represented since they are prostethic segments. For convenience, vocalic melodies are not represented.

non-reflexive counterparts, respectively *kattab* and *kaatab*. So the derivation of these forms doesn't involve templatic morphology as represented in (27).

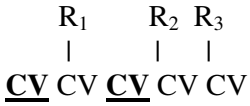
(27) ta + kattab > takattab-
ta + kaatab > takaatab-

The problem is how to represent the reflexive stems of Aramaic and Hebrew. According to the traditional Semitic studies, we may suppose that the segments *hi* , *ʔi* or *ʔe* of the prefix are prosthetic. Now, regarding the representation of the reflexive stems, several hypothesis are possible: the morpheme *t* could be either a prefix or an infix. So, let's make the following hypothesis.

3.3. Reflexive/passive stems and metathesis: a proposal.

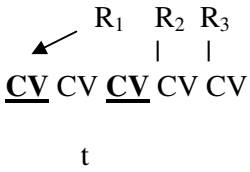
I suppose that the reflexive forms are derived from their non-reflexive counterparts (see Aïm 2003: 275-279 for a discussion on this point). Let's begin with the Aramaic basic reflexive stem *ʔetpəʕel.* I assume that it is built from the basic stem *pəʕal* represented in (28):

(28)



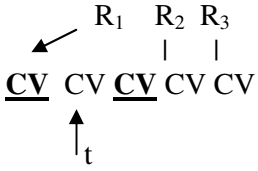
The basic reflexive stem *ʔetpəʕel* is obtained by anchorage of the first consonant of the root to the initial CV-site as it is represented in (29) :

(29)



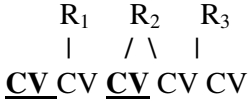
and next by the anchorage of the morpheme *t*. I suppose that this morpheme is a floating segment. It is linked to the only available consonantal slot, as shown in (30) :

(30)



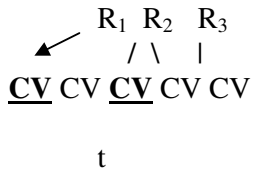
The reflexive stem *ʔetpaʕʕal / hitpaʕʕeel* is obtained in the same way. It is built from the stem *paʕʕel / piʕʕeel* depicted in (31) :

(31) paʕʕel / piʕʕeel



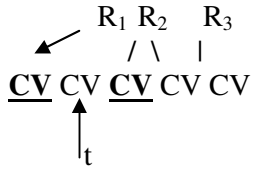
Its reflexive counterpart is obtained firstly by anchorage of the first consonant of the root to the initial CV-site :

(32)



and next by association of the floating *t* to the available consonant slot :

(33)



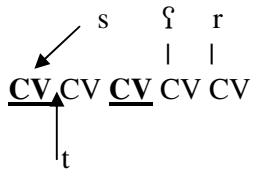
Now, let's assume that the initial CV-site of the template has the following property :

(34) the initial CV-site can host coronal obstruents only

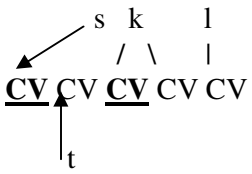
So, when the first consonant of the root is a coronal obstruent, it links to the initial CV-site ; the floating *t* links to the only available consonantal slot :

(35) R_1= coronal obstruent

a. ʔestəʕar



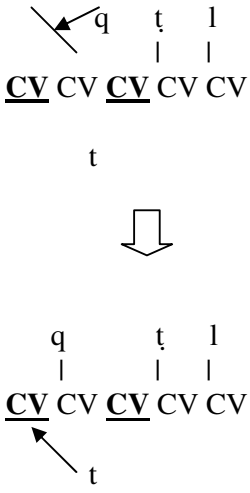
b. ʔestakkeel



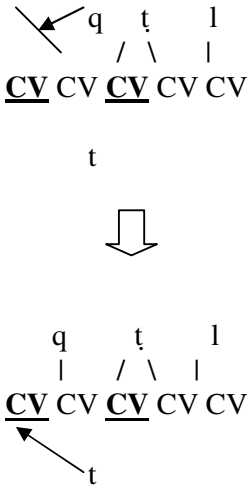
But, when the first consonant of the root is not a coronal obstruent, it cannot link to the initial CV-site; it then stays in its initial position. Therefore, the floating *t* must link to the only available consonantal slot, that is the initial CV-site. Since it is a coronal obstruent, it can do so :

(36) $R_1 \neq$ coronal obstruent

a. ʔetqəṭel



b. ʔetqaṭṭal / hitqaṭṭeel



In this analysis, the regular case is the case in which the initial CV-site is identified by the first consonant of the root, that is the case where this consonant is a coronal obstruent, and where the morpheme *t* is infixed in the surface form. The problem is that this regular case is the less common one since it implies only eight types of roots (R_1=*s, z, ṣ, š, ś, t, d, ṭ*) on a total of twenty-two (R_1=all the consonants). However, this situation seems to correspond to the more ancient situation of Aramaic and Canaanite where the morpheme *t* was apparently infixed in all cases, as in (37)[10]:

(37) Basic reflexive stem (Lipinski 1997: §41.22)

Aramaic	y-g**t**zr	"it will be cut of"	√gzr
Moabite	(w)-ʔ-l**t**ḥm	"(and) I fought"	√lḥm

According to Kaufman 1997 and Lipinski 1997, this initial seat of affixation was progressively substituted from the 8th century B.C. onwards by the one presented in the previous data.

---

[10] Note that *t* is always infixed in Ugaritic (Segert 1984) :

Reflexive basic stem			*Reflexive intensive stem*		
i-ḥ**t**rš	"I will perform magic"	√ḥrš	**t**kms	"he stretched himself"	√kms
i-š**t**mʕ	"listen"	√šmʕ			

In Phoenician, *t* is infixed in the reflexive basic stem but prefixed in the reflexive intensive stem, i.e like Classical Arabic (Segert 1976) :

Reflexive basic stem			*Reflexive intensive stem*		
t-ḥ**t**sp	"it will be torn away"	√ḥsp	h**t**-qdš	"he sanctified himself"	√qdš

The metathesis between *t* and R_1=š is attested in the intensive reflexive stem : *y-š**t**ʔl-m* "I beg you" (√šʕl).

4. Conclusion : some differences between Arabic and Aramaic/Hebrew.

I have used the Classical Arabic template to describe the Aramaic and Hebrew verbal stems. Aside from passive stems obtained by ablaut, Classical Arabic exhibits ten productive stems whereas Aramaic exhibits six stems and Hebrew five[11]. The table (38) presents each Arabic stem with its Aramaic and Hebrew equivalents:

(38)	*Arabic*	*Aramaic*	*Hebrew*
F.I	faʕal-	pəʕal	paaʕal
F.II	faʕʕal-	paʕʕel	piʕʕeel
F.III	faaʕal-	-	-
F.IV	ʔafʕal-	ʔapʕel	hipʕiil
F.V	tafaʕʕal-	ʔetpaʕʕal	hitpaʕʕeel
F.VI	tafaaʕʕal-	-	-
F.VII	ʔinfaʕal-	-	nipʕal
F.VIII	ʔiftaʕal-	ʔetpəʕel	-
F.IX	ʔifʕalal-	-	-
F.X	ʔistafʕal-	-	-
-	-	ʔettapʕal	-

The problem is the following: if Arabic, Aramaic and Hebrew have the same verbal template, why do Aramaic and Hebrew have less stems than Arabic? I have not a solution for each case, for example I don't know why the Arabic form III *kaatab* doesn't exist in Aramaic and Hebrew. However, during my analysis, I have stipulated a major hypothesis in (34). If this constraint is not a postulate that permits an appropriate description of the reflexive forms, one would expect to observe its effects somewhere else. Recall that the Arabic form IX *ʔifʕalal* is built by anchorage of the first consonant of the root to the initial CV-site:

(39) F. IX *(ʔi) fʕalal*

Since the constraint on the initial CV-site doesn't exist in the Arabic verbal template, all the consonants can execute their anchorage to this site, as illustrated in (40) where the first consonant of the root is in bold :

(40) (ʔi) **s**wadad "be/become black"
(ʔi) **ṣ**farar " be/become yellow"
(ʔi) **b**yaḍaḍ " be/become white"
(ʔi) **x**ḍarar " be/become green"
(ʔi) **ħ**marar " be/become red"
(ʔi) **ʕ**wajaj " be/become twisted"

[11] In fact, Aramaic *ʔettapʕal* doesn't seem to be a very productive stem.

The form IX doesn't exist in Aramaic and Hebrew[12]. My analysis enables to explain this fact: the derivation of this stem is constrained by the restriction on the initial CV-site. That is, only roots with a first coronal obstruent consonant should execute the anchorage. Moreover, there is no way to bypass the constraint, contrary to the reflexive forms that have at their disposal the morpheme *t*. So, it is not surprising that such a very few productive stem doesn't merely exist.

[12] Some scholars (Wright 1890: pp.218-219, Gesenius 1910: §55.d, Moscati & al. 1964: §16.24) link the Hebrew stem *paʕlal* (e.g. /raʔnan/ > *raʔănan* "to be green"), the Aramaic stem *paʕlel* (e.g. *ʕabdeḏ* "to be enslaved ") and the Arabic stem IX *(ʔi)fʕalal* together. However, contrary to the Arabic stem IX, Hebrew and Aramaic stems don't present prosthetic segments *hi/ʔi* on the left and present no vowel between R_1 and R_2 : **hiʔpʕalal vs. paʕlal, *ʔiʔpʕalel vs. paʕlel*. On the contrary, *paʕlal* and *paʕlel* stems are linked to the intensive stem *piʕʕel, paʕʕel* i) morphologicaly by the same *CvCCvC* template ii) semanticaly according to Lipinski 1997: §41.40 (*contra* Moscati & al. 1964: §16.24).

Appendix A : the stem *ʔettapʕal*

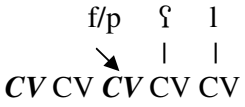
A question now arises : how is the aramaic reflexive causative *ʔettapʕal* built. This stem always exhibits a geminate *t*. This gemination is traditionnaly accounted by the assimilation of *ʔ* to *t*, as represented in (1) :

(1) /ʔe**t+ʔ**apʕal/
ʔt > tt ʔe**tt**apʕal
[ʔe**tt**apʕal]

{Notice that since the morpheme t and the first consonant of the root are never adjacent, there never is metathesis or assimilation between them.}

In fact the problem is that the total assimilation of *ʔ* is systematical in the *ʔettapʕal* stem while the assimilation of *ʔ* to a preceding consonnant is optionnal elsewhere. Suppose that the stem *ʔapʕel* is obtained in the same way as the arabic stem *(ʔ)afʕal* (stem IV) that is by anchorage of the first consonant of the root to the medial CV-site (initial *ʔ* is viewed as an epenthetic segment) :

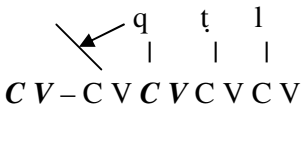
(2) Aramaic ʔapʕel / Arabic ʔafʕal-



I have assumed that the reflexive stems are built from their non-reflexive counterpart. Then, the reflexive stem must be obtained by anchorage of the first consonant of the root to the initial CV-site. However, as shown in (3a), this consonant already links to the medial CV-site. But, a segment cannot link to two head positions. Therefore, the morpheme *t* links to the initial CV-site (3b).

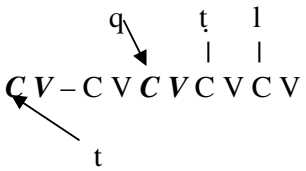
(3)

a.



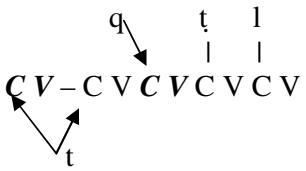
(*ʔeptapʕal)

b.



A consonantal slot remains empty. Thus, it is filled by the propagation of *t* :

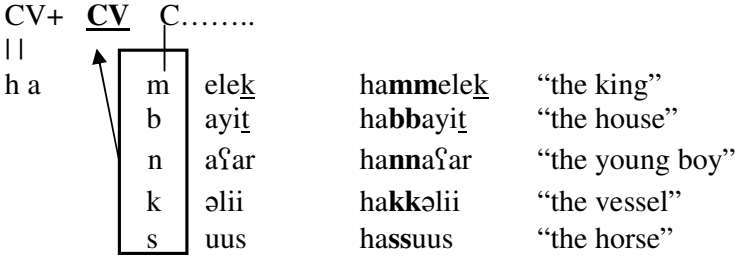
(4)



***Appendix B*: another look at the Classical Arabic definite prefix.**

Regarding the initial CV-site properties, a fact must be mentionned. According to Lowenstamm 1999, all the consonants in Hebrew (except gutturals for independent reasons) can spread on the initial CV-site during clitisization of the definite prefix, as briefly depicted in (1).

(1)



Note that the definite prefix of Aramaic is suffixed, so we cannot make the same observation.
Thus, we must conclude that the segmental constraint on the initial CV-site is exhibited only in verbal forms. The table (2) sums up these results:

(2)

		Aramaic	Hebrew	Arabic
Initial CV segmental restriction	verbs	yes	yes	no
	nouns	DNA	no	**?**

At this point, we have not observed the initial CV-site in Arabic nouns. That's what I propose to do now.
It is well-known that the lateral consonant of the Classical Arabic definite prefix undergoes a complete assimilation to the first consonant of the noun if this consonant is a coronal, obstruent or sonorant, while the other consonants have no effect. Examples are given in (3).

(3)

R1= [+coronal]		R1= [-coronal]	
ʔa**s-s**anat-	"the year"	ʔa**l-f**aras-	"the mare"
ʔa**š-š**amš-	"the sun"	ʔa**l-b**aab-	"the gate"
ʔa**z-z**ayt-	"the oil"	ʔa**l-m**awt-	"the death"
ʔa**ṣ-ṣ**ann-	"the basket"	ʔa**l-w**alad-	"the boy"
ʔa**t-t**awr-	"the vase"	ʔa**l-j**awr-	"the iniquity"
ʔa**d-d**aar-	"the house"	ʔa**l-y**amm-	"the sea"
ʔa**ṭ-ṭ**all-	"the dew"	ʔa**l-k**itaab-	"the book"
ʔa**ḍ-ḍ**all-	"the straying"	ʔa**l-q**ariiḍ-	"the poetry"
ʔa**ð-ð**alq-	"the tip of the tongue"	ʔa**l-x**aatam-	"the ring"
ʔa**θ-θ**awb-	"the garment"	ʔa**l-ɣ**adat-	"the lunch"
ʔa**ð̣-ð̣**ullat-	"the cover"	ʔa**l-ħ**azr-	"the prohibition"
ʔa**n-n**ahr-	"the river"	ʔa**l-ʕ**afr-	"the dust"
ʔa**r-r**ašm-	"the trace"	ʔa**l-ʔ**ab-	"the father"
ʔa**l-l**aban-	"the milk"	ʔa**l-h**arab-	"the escape"

Note that the lateral consonant doesn't undergo this assimilation elsewhere[13]:

(4)	za**lz**al-	*za**zz**al-	"shake"	(√zl reduplicate)
	su**lṭ**an-	*su**ṭṭ**an	"sultan"	(√slṭn)
	ʔi**l-t**-amas-	*ʔi**t-t**-amas-	"try to touch, ask"	(√lms "touch", stem VIII)
	qu**l-n**aa	*qu**n-n**aa	"we have said"	

So the question is why would the assimilation of *l* take place only when this *l* is a part of the definite prefix. I suggest that these facts are nothing but another instance of the segmental restriction of the initial CV-site. Let's assume that the initial CV-site of the noun template has the following property :

(5) the initial CV-site can host only coronals

Suppose that the phonological form of the definite prefix is as in (6), that is without a lateral consonant in deep structure:

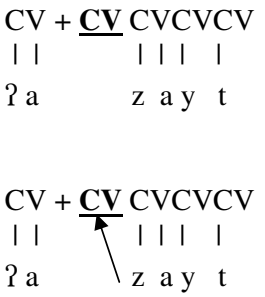
(6)
```
CV –
| |
ʔ a
```

Now, when this prefix is attached to the left margin of a noun, it appears that the initial CV-site is empty. Yet, since it is in the middle of a phonological word, it cannot stay empty. Thus, when the first consonant of the noun is a coronal, the spreading strategy is possible, as shown in (7a). But, when the first consonant of the noun is not a coronal, spreading on the CV-site is merely impossible. So the empty C slot is filled by an epenthetic lateral consonant as shown in (7b)[14].

[13] Other total assimilations of *l* to a following consonant appear with the interrogative particle *hal* and *bal* "but", e.g. /ba**l** **ð**annantum/ > [ba**ðð**annantum] "but you have thought". However, unlike the definite article assimilation, these assimilations are restricted to a subset of coronals. This subset differs according to some arabic grammarians; it is thus *t, θ, s, z, ṭ, ð, ḍ* or only *t, θ, s* ; in Hedjazi pronunciation, no assimilation occurs.

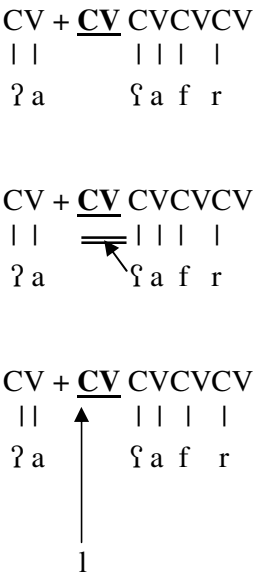
[14] Ullendorff 1965 has previously proposed that the Arabic article resulted historicaly from a dissimilation of consonant gemination, this consonant gemination being the original form (as in Hebrew). See also Lambdin 1971.

(7) a. R1= [+coronal]



ʔa**zz**ayt-

b. R1= [-coronal]



ʔa**l**ʕafr-

This analysis supposes that *l* is a possible epenthetic segment in Classical Arabic. The well-known Classical Arabic epenthetic consonants are *ʔ, w, y*, *n*. Bohas 1997 claims that the Semitic roots are biradical. The emergence of a third consonant is only needed to satisfy the triliteral template. Among current strategies like gemination of the second radical or glide epenthesis, Bohas points out that sonorant epenthesis occurs, and among them *l* epenthesis also occurs :

(8)

√ jz "cut"

	R_2 gemination	jaz**z**a	"cut the hair, cereal, date"
	r epenthesis	jaza**r**a	"cut date, slaughter (cattle), massacre, cut"
☞	*l* epenthesis	jaza**l**a[15]	"cut, divide, separate from the rest by cutting"

√dj "cover"

	R_2 gemination	daj**j**a	"be overcast (sky), cover"
	n epenthesis	daja**n**a	"be dark and rainy"
☞	*l* epenthesis	daja**l**a	"be covered, covered up so much that it disappears under something else"

√ fs "dissociate"

	R_2 gemination	faṣ**ṣ**a	"draw off, extract, detach"
	m epenthesis	faṣa**m**a[16]	"be cut and dissociate"
☞	*l* epenthesis	faṣa**l**a	"extract, detach, dissociate"

[15] Attested in stem II *jazzala*.
[16] Attested in stem VIII *ʔiftaṣama*.

√ bt “cut”

	gémination	bat**t**a	“cut”
	r epenthesis	bata**r**a	“cut, cut an animal’s tail”
		ba**r**ata	“cut”
☞	*l* epenthesis	bata**l**a	“cut, separate”
		ba**l**ata	“cut, separate, divide by cutting”

References

AÏM, E. (2003), *Questions de phonologie et de morphologie sémitiques*, Thèse de doctorat, Université Paris 7.

BAR-ASHER, M. (1999), *L'hébreu mishnique: études linguistiques*, Paris/Louvain : Peeters.

BOHAS, G., (1997), *Matrices, étymons, racines. Eléments d'une théorie lexicologique du vocabulaire arabe*. Paris/Louvain : Peeters.

BOHAS, G. (1999), « La logique du signe "vocalisateur" (mhagyānā) et du signe "accélérateur" (marṭānā) dans la phonologie du syriaque : une approche de la structure syllabique », *Bulletin d'Etudes Orientales* 51 : 127-149.

BOLOZKY, S. (1997), « Israeli Hebrew Phonology », in *Phonologies in Asia and Africa*, A.S. Kaye (éd.)., Winona Lake : Eisenbrauns. 287-311.

BROWN, F., DRIVER S.R. & C.A. BRIGGS (1907), *A Hebrew and English Lexicon of the Old Testament, with an appendix containing the Biblical Aramaic*, Oxford : Clarendon Press. (reprint 1952).

DUVAL, R. (1881), *Traité de grammaire syriaque*, Amsterdam : Philo Press. (reprint 1969).

FLEISCH, H. (1961-1979), *Traité de philologie arabe I et II*., Beyrouth : Dar el-Machreq. (reprint 1990).

FUDGE, E. (1969), « Syllables », *Journal of Linguistics* 5 : 253-287.

GESENIUS W. (1910), *Gesenius' Hebrew Grammar (as edited and enlarged by E. Kautzsch and revised by A.E. Cowley)*, Oxford : Clarendon Press.

GREENBERG, J. (1950), « The patterning of root morphemes in Semitic », *Word* 6 : 162-181.

GREENBERG, J. (1978), « Some generalizations concerning initial and final consonant clusters », in *Universals of Human Language, vol. 2 : Phonology*, Greenberg J. (éd.), Stanford : Stanford University Press.

GUERSSEL, M. & J. LOWENSTAMM (1990), *The Derivational Morphology of the Classical Arabic Verbal System*, ms. Université Paris 7 Denis Diderot et U.Q.A.M..

JASTROW, M. (1886-1903), *A Dictionary of the Targumim, the Talmud Babli and Yerushalmi, and the Midrashic Literature*, New York : The Judaïca Press (reprint 1996).

KAUFMAN, S.A. (1997), « Aramaic », in *The Semitic Languages*, R. Hetzron (éd.). 1997, London : Routledge. 114-130.

KAYE, J.D. (1992) « Do you believe in magic ? The story of s+C sequences », *SOAS Working papers in Linguistics and Phonetics* 2 : 293-313.

KAYE, J., LOWENSTAMM J. & J.R. VERGNAUD (1990), « Constituent Structure and Government in Phonology », *Phonology* 7.2 : 193-231.

KENSTOWICZ, M. (1994), *Phonology in Generative Grammar*, Oxford : Blackwell.

LAMBDIN, T.O. (1971), « The Junctural Origin of the West Semitic Definite Article », in *Near Eastern Studies in Honor of William Foxwell Albright*, Goedicke H. (ed.), Baltimore : Johns Hopkins University Press. 315-333.

LEVY, J. (1868), *Chaldäisches Wörterbuch über die Targumim*, Köln : Joseph Melzer (reprint 1959)

LIPINSKI, E. (1997), *Semitic Languages. Outline of a Comparative Grammar*, Paris/Louvain : Peeters.

LOWENSTAMM, J. (1996), « CV as the Only Syllabe Type », in *Current Trends in Phonology* 2, Durand J. & B. Lacks (éds)., Salford & Manchester : ESRI. 419-441.

LOWENSTAMM, J. (1999), « The Beginning of the Word », in *Phonologica 1996: Syllables?!*, Rennison J. & K. Kühnhammer (éds.), The Hague : Holland Academic Graphics. 153-166.

LOWENSTAMM, J. (2002) *A note on the segmental identification of templatic sites*, ms. Université Paris 7.

LOWENSTAMM, J. (2003), « Remarks on Mutae cum Liquidā and Branching Onset », in *Living on the Edge*, S. Ploch (ed.), Mouton de Gruyter: Berlin. 339-363.

MACUCH, R. (1965), *Handbook of Classical and Modern Mandaic*, Berlin : De Gruyter.

MALONE, J.L. (1971) « Systematic metathesis in Mandaic », *Language* 47 : 394-415.

MOSCATI, S. & al. (1964), *An Introduction to the Comparative Grammar of the Semitic Languages*, Wiesbaden : Harrassowitz.

NÖLDEKE, T. (1875), *Mandäische Grammatik*, Darmstadt : Wissenschaftliche Buchsgesellschaft (réédition 1964).

PARADIS C. & J.-F. PRUNET (éds.) (1991) *The special status of coronals : Internal and external evidence*, San Diego : Academic Press.

SEGAL, M.H. (1927), *A Grammar of Mishnaic Hebrew*, Oxford : Clarendon Press. (reprint 1970).

SEGERT, S. (1976), *A Grammar of Phoenician and Punic*, München : Beck.

SEGERT, S. (1984), *A Basic Grammar of the Ugaritic Language*, Berkeley : University of California Press.

STEVENSON, W.B. (1924), *Grammar of Palestinian Jewish Aramaic*, Oxford : Clarendon Press. (réédition 1956).

ULLENDORFF, E. (1965), The Form of the Definite Article in Arabic and Other Semitic Languages », in *Arabic and Islamic Studies in Honor of Hamilton A.R. Gibb*, Makdisi G. (ed.), Leiden. 631-637.

WRIGHT, W. (1890), *Lectures on the Comparative Grammar of the Semitic Languages*, Amsterdam : Philo Press. (reprint 1966).