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| RESEARCH ARTICLE

Nominal French Loanwords' Initial Gemination in Kenitra's Dialect: An Optimality-Theoretic Analysis

Said Rafi
Doctoral student, Faculty of Languages, Letters, and Arts, English Department, Ibn Tofail University, Kenitra, Morocco
Corresponding Author: Said Rafi, **E-mail**: said.rafi@uit.ac.ma

| ABSTRACT
This paper investigates French nominal loanwords' initial gemination in Kenitra's dialect in Moroccan Arabic within the framework of optimality theory. It studies the initial geminates that surface in borrowed nominal words from French into Kenitra's dialect as well as looks into why the source words do not have geminate segments. The focus is to unfold the reason behind the emergence of geminate consonants when they are adapted into Kenitra's dialect from French nominal words. Under the purview of optimality theory, we introduce and discuss the interaction between constraints in this dialect and how they conflict to allow the harmonic candidate to surface. The significance of this research is to provide evidence that initial geminates are inherently moraic in MA, especially Kenitra's dialect.

| KEYWORDS
Initial geminates, Moroccan Arabic, Constraints, French loans, Adaptation, Optimality Theory

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1. Introduction

The changes that occur in languages have always been interesting subjects to observe. These alternations come from different phenomena that a language might encounter. For instance, language contact leads to structural changes, such as borrowing a word from one language and adapting it to another one resulting in some changes. As far as this paper is concerned, Moroccan Arabic (MA) is rich when it comes to borrowing from different languages (e.g., Amazigh, French, and Spanish). Although languages adapt linguistic items from different languages, the adaptation does not happen arbitrarily. The variations that happen within a word when borrowing and adapting a word into a certain language are controlled by the phonotactic constraints of the recipient language, which in some cases result in geminated words. To better understand this issue, this paper investigates the French loanwords adaptation into MA, specifically in Kenitra's variety, a Moroccan dialect (henceforth, KD).

In recent years, there has been an increasing amount of literature on loanwords' adaptation into MA. However, the focus has been on whether loanwords' adaptation is phonetic or phonological. Smirkou (2020) claims that "MA speakers, as regards their adaptation of French complex codas, do not rely on any phonetic features or perceptual similarity between French and MA sound inventory but on their phonological competence in L1" (p. 67). However, the primary aim of this paper is to explore the initial geminate that surfaces in KD while borrowing and adopting nominal French words into it. Recent studies have shown that gemination in MA is motivated by three different reasons: lexical, assimilation, and morphological (Noamane, 2020). Along the same lines, Boudlal (2001) accounts for two types of gemination: initial geminates and final geminates. The former happens as a result of a cluster of consonants that share some common features, while the latter cannot be split. In verbs that contain three segments, the epenthesis is blocked due to higher constraints (see Boudlal, 2001, pp. 81-82 for detailed information on how epenthesis is blocked to prevent breaking the cluster of trisegmental geminates in verbs).

This paper accounts for nominal French loanwords in KD within the constraint-based theory, optimality theory (OT) (Prince & Smolensky, 1993). OT provides a useful account of how the initial geminate of nominal French loanwords surfaces in KD. Furthermore, the proposed theory unveils the interaction between constraints that emanates the optimal output. In other words, the interaction between several constraints generates the optimal candidate, which satisfies the higher-ranked constraint and incurs minimal violations. This paper also contributes to the debated issue of whether the initial geminate is inherently moraic or not.

The paper is organized as follows: section 2 gives a brief review of the conducted research on gemination in MA in addition to the concept of gemination and its motivation in MA. Also, it provides gemination cross-linguistically by providing stances from three different languages, namely Cairene Arabic, Tashlhiyt, and English. Section 3 presents a brief description of loanword phonology. The collected data will be provided and analyzed within the framework of OT in section 4, in addition to reflecting on whether initial geminate is inherently moraic or not. Section 5 concludes the paper.

2. Literature Review

In recent years, there has been a greater focus placed on gemination within the framework of OT literature in MA. Boudlal (2001) provides two different positions of geminates in Casablanca Moroccan Arabic, where he adopts two theories to account for final and initial geminates. Boudlal (2001) finds out that initial geminates arise from the occurrence of two contiguous coronal segments, whilst the final geminates occur only in the language he investigated. Other authors look at gemination from different perspectives. For instance, the behavior of consonants geminates by adopting moraic representation and segmental representation (Noamane, 2019). The data below show the moraic representation of the word initial-geminates.

(1) Moraic word-initial geminates in MA (Noamane, 2019, p. 105)

a.	ddi	'to take'
b.	mm^{w}i	'my mother.'
c.	bb^{w}a	'my father'
d.	lla	'no'

The data in (1) show that germination occurs initially. Noamane (2019) argues that geminates in MA are underlyingly moraic, and his claim is supported by providing three pieces of evidence: word minimality, compensatory lengthening, and the moraic representation (see Noamane, 2019, for further details on the moraic nature of geminate consonants in Moroccan Arabic).

The existing literature on gemination in MA is extensive and focuses particularly on the positions of geminate consonants in phonology and morphology. Four major types of gemination are found in the literature: lexical, assimilated, concatenated, and true gemination vs. fake gemination (Oh & Redford, 2012). Zeroual et al. (2012) focus on the physiology and acoustics of word-initial post-lexical gemination, where the geminate consonant is measured by EMA software[1]. This latter ascertains that geminate in MA has the longer constriction and acoustic closure compared to singleton (one segment).

By far, the most well-known account of gemination in MA is found in the work of Noamane (2020). He investigated three main issues about gemination: the motivation of gemination, definite article assimilation, and 1st person pronoun assimilation, and the role of gemination in word formation.

2.1 Gemination Cross-linguistically

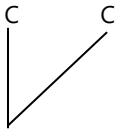
Languages around the world share some universal characteristics. Gemination is one of these universal characteristics. Tashlhiyt, Bengali, Bernese, Iraqi Arabic, Japanese, Hungarian, Levantine Arabic, MA, Palestinian Arabic, Tamil, and Turkish have this phenomenon, to name but a few (Mubarak & Jebur 1996; Ridouane 2010). The following paragraphs only focus on geminates in Arabic, Tashlhiyt, and English for the sake of conciseness. ADs have two different representations where geminate consonants occur: word-medial and word-final positions (Davis & Ragheb, 2014).

At the phonological level, Davis and Ragheb (2014) argue that there are two contrasting views regarding the presentation of geminate consonants in Arabic Dialects (ADs). The first view is the prosodic length analysis of geminates. The second view is the moraic weight representation. The prosodic length analysis of geminates is traced back to Leben (1980), who put an autosegmental representation of geminates to approach the behavior of a single phoneme that is linked to two C-slots on the skeletal tier that converts the prosody word in terms of C-slots and V-slots (as cited in Davis & Ragheb, 2014). The segment /s/ in the word /Kassar/ 'he smashed' is attached to two C-slots, as shown below in (2A).

[1] Electromagnetic articulography (EMA) is a method of measuring the position of parts of the mouth.

(2). Prosodic length analysis of geminates (Davis & Ragheb, 2014)

A. Geminate in UR



B. Single consonant in UR

In the view of C-slots and V-slots, the geminate which is linked to two C-slots is presented as shown in (2A), whereas a nongeminate is represented as a single phoneme associated with one C-slots as shown in (2B). The following view is the moraic weight representation of geminates, which was first posited by Hayes (1989), who argued that geminate consonant has inherent weight. In moraic phonology, Hayes (1989) considers tier as moraic rather than segmental. In the same line, Davis and Ragheb (2014) regard a geminate consonant as different from a singleton. The former is underlyingly linked to a mora, but the latter is not. The following representations demonstrate the difference between the two types of consonants from Hayes (1989) and Davis & Ragheb's (2014) point of view:

(3). Moraic weight representation of geminate (Hayes, 1989)

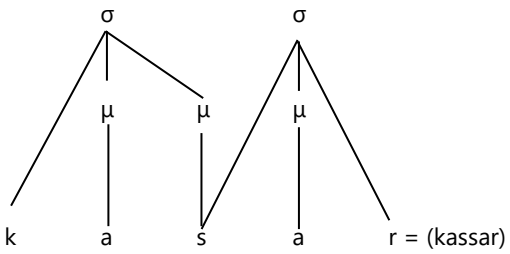
A. Geminate in UR

B. Single consonants in UR

s = /s/
(singleton)

(4). Surface syllabification with moraic structure (Davis & Ragheb, 2014)

(σ = syllable)



The first syllable kas of the word /Kassar/ 'he smashed' is heavy because the coda is bimoraic while the coda of the second syllable is monomoraic, which is considered a light syllable in the moraic theory. Since geminates in ADs are moraic, it has been shown that ADs have strong evidence that consonant lies in the moraic weight representation (Davis & Ragheb, 2014).

Contrary to Tashlhiyt, Berber has contrastive singleton and lexical consonants in all positions. More specifically, Tashlhiyt Berber has been investigated phonetically (see Ridouane, 2010 for further details on gemination at the junction of phonetics and phonology). In this respect, Tashlhiyt Berber has two phonologically derived geminate types: concatenated and assimilated geminates (see Ridouane, 2010). The data below shows the occurrence of assimilated, and concatenated geminates.

(5). Concatenated geminate (Ridouane, 2010, p. 17)

A. /tut tins/ [tuttins] 'she hit hers'

(6). Assimilated geminate

B. /rad tut/ [rattut] 'she will hit'

The representation of the concatenated geminate in (5A) is underlyingly described as two-timing slots, each associated with a melodic unit. Assimilated geminates in (6B), however, arise from the spreading of one segment onto the other, which are represented as two-timing units linked with a single melodic unit (Ridouane, 2010).

Gemination in English is considered null. McCarthy 1986, and Kraehenmann 2003, to name but a few, have argued that English has only fake gemination. Kaye (2005), however, has an opposite view regarding this matter. The findings of his experiment show that English has consonantal gemination (see Kaye, 2005 for further details on gemination in English).

Gemination has been investigated in different languages at different levels, namely phonetics and phonology. Respectively, each language exhibits different types and positions of geminate consonants as they can occur initially, medially, and finally. The selected languages in this section displayed that geminate consonants have three different geminates: prosodic length, moraic weight representation, and concatenated and assimilated. For instance, ADs have the prosodic length analysis of geminates and the moraic weight representation. As for Tashlhiyt, geminate consonants have two types: concatenated and assimilated. Last, English shows that there is a difference between geminates and non-geminates in terms of duration.

2.2 Loanword Phonology

As far as this paper is concerned, Loanword phonology should be addressed as such. Loanword, borrowing, and phonology have been frequently used recently in the field of linguistics. As far as loanword is concerned, the term loanword generally refers to" a word borrowed from one language into another" (Brown & Miller, 2013, p. 271). However, this latter is narrowed. Thus, understanding loanwords require a deep insight rather than simply considering it as taking a word from a language and including it in another.

Loanwords seem to occur as a result of language contact. Languages borrow some words from other languages and adapt them. It is due to the impact of adaptation that some phonological, morphological, and phonotactics changes arise (Silverman, 1992). That is, a language that borrows a word from another language should adapt that word into the phonotactics, phonology, and morphology of the host language. For example, the French word /sup/ 'soup' is borrowed to MA as /sob.ba/. The feminine template of MA forces the alternation of the internal syllable structure of the borrowed word. Since each language has its sound inventory, languages vary in the number of sounds in their inventories. Therefore, the adaptation of some segments can be blocked if the recipient language does not have similar sounds to the source language.

Silverman (1992, p. 290) provides two levels of adaptation in which the adapted words agree to the constraints of the host languages: the perceptual and the operative level. On the one hand, the receiver/hearer of the host language select a segment that is slightly similar to the foreign language and adapts it to his/her native language at the perceptual level (Silverman, 1992, p. 296). To illustrate, the French word /kʌp/ 'the cup' is adapted as /kub.ba/ in MA. Indeed, the sound [p] sometimes exists in MA in the case where the sound [b] is perceived as [p] before a voiceless stop or fricative (e.g., /l-ħebs/ 'prison") (Harrel, 1962); therefore, it is changed into the sound [b], which is similar to [p] in the place and manner of articulation. On the other hand, at the operative level, the phonotactic constraints of the host language intervene to hinder any non-permissible sequences. This latter is a language-specific constraint. For instance, three consonants are allowed words initially, such as street, strike, and spring, whereas the Japanese language does not allow such a sequence (cf. Alkhuli, 2000 for English; Kar, 2010 for Japanese). In this regard, the Japanese language borrows the word 'strike' from English as 'sutoraiko' due to the language phonotactics on syllable structure that the Japanese language allows, which is the 'CV' structure.

2.3 Loanword Phonology within Optimality Theory

The previous section provided insight into loanword phonology, and it shows how borrowed words are adapted into the recipient language following the phonotactics of the host language. In the same regard, Louriz (2012) states that "OT proves promising to loanword research" (p. 225). OT framework affords markedness and faithfulness constraints to the grammar of the borrowing languages. It has been found that markedness constraints dominate faithfulness constraints (Sayahi, 2005). By using OT, Sayahi (2005) argues that the adapted words from Spanish into Northern MA tend to rank the markedness constraints over faithfulness ones. Consider the data bellow (Sayahi, 2005, p. 258):

(7)

A. enchufe	/linčufi/	'plug'
B. ancla	/lankla/	'anchor'
C. antenna	/lintina/	'antenna'
D. empalme	/linplame/	'juncture'

(8)

/enchufe/	Ons	*Ons/nas-Obst	Max-IO	Dep-IO
a. inčufi	*!		*	
b. nčufi		*!	*	
c. čufi			*!	
☞ d. linčufi				*

The tableau above shows that Northern MA does not accept onsetless syllables and a sequence of nasal plus obstruent in the onset position. In other words, candidate (8a) is ruled out by ONS because Northern MA does not allow onsetless syllables, and the same happens to candidate (8b), which violates the constraint against any sequence of nasal plus obstruent in the onset. Following Sayahi (2005), markedness constraints outrank faithfulness constraints, which is the case in loanword phonology. Since this paper is concerned with loanword adaptation within OT, it is indispensable to provide a brief discussion of loanword constraints' ranking. Louriz (2012) states that loanwords preserve identical markedness ranking constraints. However, they do differ in terms of faithfulness. Louriz (2012) distinguishes three types of ranking in loanword adaptation: divergent repairs, importations, and retreat to the unmarked.

To conclude this section, the literature identifies the positions of gemination in three different languages, namely ADs, Tashlhiyt, and English. Furthermore, loanword phonology has interestingly unfolded two levels of adaptation in which the adapted words agree to the constraints of the host languages: the perceptual level and the operative level (Sayahi, 1992). However, Louriz (2012) and Sayahi (2005) follow the same line regarding the ranking of markedness constraints above faithfulness constraints in loanword phonology. As far as this paper is concerned, the following section presents the data collected from Kenitra, a spoken dialect in the west of Morocco. The focus will be on French loanwords' initial geminate consonant in Kenitra's dialect.

3. French Loanwords' Initial Gemination in Kenitra Dialect

A distinction of sound inventories is required to show the similarities and differences between MA and French. MA phonemic system has three vowel phonemes {a, i, u} in addition to schwa epenthesis {ə}. Moreover, MA consists of the following consonants: {b, f, m, w, t, ṭ, d, ḍ, s, ṣ, z, ẓ, n, l, r, ṛ, j, ʃ, ʒ, k, kw, g, gw, x, xw, ɣ, ɣw, q, qw, ħ, ʕ, ɦ}. As for simple and their geminates counterparts, MA systematically differentiates between them; however, vowels do not have length contrast (Louriz, 2012). On the contrary, French has more vowels than MA in its system {a, é, l, o, u, y, ö, ë, ò, e, è} as well as nasal vowels {â, ô, ê}. Additionally, consonants in French are {b, d, f, k, l, m, n, p, s, t, v, z, g, n, r, s, z, dʒ, tʃ}. It is clear that French has limited consonants compared to MA.

3.1 Initial Geminates in KD data

The data are collected from the spontaneous speech of native speakers in MA, specifically KD. Additionally, the words that are collected in the data from the French loans seem to be used by nearly everyone (if not all). Interestingly, almost all MA speakers who do not speak French utilize loanwords without being aware of them. Although germination occurs in all positions and is commonly used over a speech by speakers, the analysis and focus will only be on French loanwords that have geminate consonants in the initial position KD.

(A)

French	KD	Gloss
ʁe.zo	r.ri.zu	'Network'
sa.vɔ̃	ṣ.ṣa.bun	'Soap'
ʁe.ʒim	r.ri.ʒim	'Diet'
ʃo.fœʁ	ʃ.ʃi.fur	'Driver'
ʃo.fo	ʃ.ʃu.fu	'Water heater'
ʁa.zwaʁ	z.zi.zwar	'Shaver'
de.sɛʁ	d.di.sir	'dessert'
sak	ṣ.ṣak	'Bag'

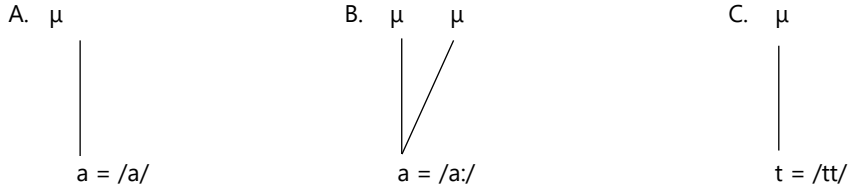
te.le.fɔn	t.ti.li.fun	'Phone
si.ʁo	s.siro	'Syrup'
tɛ.ʁas	ṭ.ṭi.ras	'Terrace'
tɛ.ʁɛ̃	t.ti.ran	'Field'
ʃo.maʒ	ʃ.ʃo.maʒ	'Unemployment'
saʁ.din	s.sər.din	'Sardine'
sɛ̃.tyʁ	ṣ.ṣəm.ṭa	'Belt'
sɛr.vis	s.sər.bis	'Service'

As can be seen in the data above, the initial geminate of the French loanwords in KD is significant. Throughout the analysis of this paper, it will be shown that initial geminates in MA are inherently moraic. In the same regard, it has been argued that initial geminates in MA are inherently moraic (Noamane, 2019). The data below are taken from Noamane (2019) to support this claim (Noamane, 2019, p. 105):

(b)		
ddi	*di	'to take'
mm^{w}i	*m^{w}i	'my mother'
bb^{w}a	*b^{w}a	'my father'

Morén (1999) points out that initial geminates are moraic by proposing two sources of weight to distinguish between geminates followed by a vowel (GV) and a singleton followed by a vowel (CV). The first weight is coerced, which supports the idea of underlying moraicity that is presented on the surface as a result of lexical specifications such as vowels and geminates, and the second weight is "a restriction on surface moraicity in some phonological context (e.g., weight-by-position)" (Morén, 1999, p. 1). In the same regard, "it is argued that geminates and vowels have distinctive weight by dint of being inherently moraic" (Noamane, 2019, p. 106). Hayes (1989) makes a similar point regarding underlying moraic height. Consider the representation below:

(9) Underlying moraic weight presentation (Hayes, 1989)



It is interesting that the data in (9A) also display initial geminate consonants in KD. In fact, GV exists in MA. For instance, word /ʁezo/ is realized as /r$^{\mu}$i.zu/ in KD. This implies that there is an undominated constraint that blocks the output /rizu/ to surface as non-geminates. Constraints within OT have been seriously studied among languages evaluating the constraints between input and output by moving from the former to the latter. This paper reverses the direction of the evaluator function between the two. In other words, the evaluator function of constraints moves from the output to the input due to a new constraint, which is created to support the claim of moraicity in the initial geminates in KD. That is, the new constraint is required to prevent any non-moraic geminates. The constraint is as follows:

3.1.1 Ident-weight-IO

Input moras should be preserved in the output.

Since our analysis is mainly based on loanword phonology, it is necessary to establish another constraint that is related to adaptation that militates against the winner. Investigation into adaptation, Dell and Elmedlaoui (2012) show that "when words from other languages are adapted into MA, the moroccanized forms bear some resemblance to the original Words." (p. 282). the constraint is as follows:

3.1.2 FaithAdapt

the material of the source form (Input) must be present in the borrowed form (Output).

The double consonants/geminates will be presented as a segment bearing a mora (e.g., rᵘizu) for illustration. Consider the interaction of two constraints, namely Ident-weight-IO, in the tableau below:

(10)

/ʁe.zo/	FaithAdapt	Ident-weight-IO
☹ a. rᵘi.zu	*!	
☞ b. ʁe.zo		*

The sound /ʁ/ is realized as /r/ in KD because that sound does not exist in the sound inventory of KD. According to Campbell (2013) "in adaptation, a foreign sound in borrowed words which does not exist in the receiving language will be replaced by the nearest phonetic equivalent to it in the borrowing language" (p. 59). Tableau (10) shows that candidate (10a) is ruled out because it violates the higher-ranked constraint, which adds a new material (mora) that does not exist in the source input. However, candidate (10b) is the winner as it satisfies the higher-ranked constraint, and it is faithful to the input. The symbol ☹ indicates that the harmonic and correct candidate does not appear as the winner. Therefore, it should be noted that the French inputs are irrelevant to our analysis as our main concern is KD inputs. Tableau (10) is only to show that the constraint FaithAdapt is active, and it is not the higher-ranked constraint in KD. Nevertheless, FaithAdapt is an essential constraint in loanword phonology, but it derives an undesirable candidate (10b). Since FaithAdapt is not related to the analysis, *Gem constraint replaces it as it militates against the winner because KD allows geminates. In fact, *Gem prevents any geminate consonants. Now, let us consider another candidate that might emerge as a winner. Consider the tableau below:

(11) /GV.CV/ output geminate structures in KD

/rᵘi.zu/	Ident-weight-IO	*Gem
☞ a. rᵘi.zu		*
b. ʁe.zo	*!	
c. rᵘi.zzu		**!
☜ d. rᵘiz.u		*

The tableau above shows that candidates (11a) and (11d) are in a tie while the candidate (11b) is disqualified due to its violation of the higher-ranked constraint as well as the candidate (11c), which incurs two violations of the lower-ranked constraint. This means that the number of violations is decisive between (11a, c, d). However, we still have a problem concerning the winner. Is it (11a) or (11d)?

In the loanword phonology section, we showed that MA does not allow onsetless syllables. Thus, the ONS constraint will be undominated in the hierarchy of constraints. The current ranking of constraints is as follows:
ONS, Ident-weight-IO>> *Gem

(12)

/rᵘi.zu/	ONS	Ident-weight-IO	*Gem
☞ a. rᵘi.zu			*
d. ʁe.zo		*!	
e. rᵘi.zzu			**!
d. rᵘiz.u	*!		*

After establishing the ranking of constraints that exclude the potential candidate (12d), the new ranking of constraints is as follows: ONS, Ident-weight-IO >> *GEM

(13)

/rᵘi.zu/	ONS	Ident-weight-IO	*Gem
☞ a. rᵘi.zu			*
b. ʁe.zo		*!	
c. rᵘi.zzu			**
d. rᵘiz.u	*!		*

In Tableau (13), there is a dotted vertical line between the constraints ONS and Ident-weight-IO. This line means that there is no interaction between the constraints, and they are at the same level. Moreover, there is a solid line between constraints Ident-weight-IO and *Gem, which implies that there is a conflict between the two constraints. In other words, if the two higher-ranked constraints are reranked, the result will be the same. Back to the candidate (13d), it is ruled out because it incurs a fatal violation of the undominated constraint ONS, which does not allow onsetless syllables in MA, especially KD. The ranking of constraints in tableau (10, 11, 12, and 13) is attested to outputs that have the structure (GV.CV). What about other structures such as (GV.CVC) and (GVC)? The answer to this question lies in the tableau below:

(14)
/GV.CVC/ output geminate structures in KD

/ʂᵘa.bun/	ONS	Ident-weight-IO	*Gem
☞ a. ʂᵘa.bun			*
b. sa.vɔ̃		*!	
c. ʂᵘ.abun	*!		*
☜ d. ʂᵘa.bu.n			*

The same constraints in tableau (13) are applied in tableau (14) to a different set of candidates and different structures; however, candidates (14a) and (14d) are in a tie. One thing that is interesting about the candidate (14d) is its creation of a new syllable to increase its chance of emerging as a winner. The strategy of creating a potential candidate fails to happen because there is another higher-ranked constraint that blocks any consonant that occupies the peak position in a syllable. Now, the ranking of constraints, including the new constraint (ConsPeak)[2] is as follows: ONS, Ident-Weight-IO >> ConsPeakt >> *GEM

(15)

/ʂᵘa.bun/	ONS	Ident-weight-IO	ConsPeak	*Gem
☞ a. ʂᵘa.bun				*
b. sa.vɔ̃		*!		
c. ʂᵘ.abun	*!			*
d. ʂᵘa.bu.n			*!	*

On the one hand, we can conclude from the tableau above that candidate (15a) is the optimal one. On the other hand, however, candidate (15c) incurs a fatal violation of constraint ConsPeak, which does not allow consonants to take the place of vowel (peak) inside a syllable. Suppose that KD makes use of a repair strategy that assigns a mora to the syllable that contains a consonant at its peak. For example, the word /ʂᵘa.bun/ 'soap' is surfaced as ʂᵘa.bu.(nᵘ) in the output. There will be two winners, as shown in the tableau below:

[2] ConsPeak: is a constraint that was introduced by Lin (1997), which claims that Consonants cannot serve as syllables

(16)

/ʂᵘa.bun/	ONS	Ident-weight-IO	ConsPeak	*Gem
☞ a. ʂᵘa.bun				*
b. sa.vɔ̃		*!		
c. ʂᵘa.bu.n			*!	*
d. ʂᵘ.abu.n	*!		*	*
☜ e. ʂᵘa.bu.(nᵘ)				*

To avoid any misunderstanding between geminates = cᵘ and the segment that has received a mora, the latter is presented as "(cᵘ)" (e.g., (nᵘ)). Before solving the problem of having two potential optimal candidates, a distinction between a syllable that has a consonant bearing a mora as its peak (e.g., nᵘ) and a syllable that has a vowel in its peak (e.g., na) must be clarified. Boudlal (2001) states that a syllable that consists of a consonant, even if it bears a mora in its peak, is considered a minor syllable, whereas a syllable that consists of a full vowel in its peak is considered a major syllable. Let us discover the new constraint that rules out the candidate (16e). *Minor syllable (*Min-σ) prohibits any minor syllable. Moreover, there is no conflict between ConsPeak and *Min-σ. Indeed, ConsPeak and *Min-σ are prohibited in MA. Consider the following tableau:

(17)

/ʂᵘa.bun/	ONS	Ident-weight-IO	ConsPeak	*Min-σ	*Gem
☞ a. ʂᵘa.bun					*
b. sa.vɔ̃		*!			
c. ʂᵘa.bu.n			*!		*
d. ʂᵘ.abu.n	*!		*		*
e. ʂᵘa.bu.(nᵘ)				*!	*

As shown in the tableau above, candidate (17a) is the harmonic candidate as it only violates the lower-ranked constraint *Gem. Therefore, the candidate (17e) whose consonant bears a mora and occupies the nucleus of a syllable is blocked to surface as an optimal output. Furthermore, candidates (17c, 17d) incur fatal violations of the higher-ranked constraints. Let us look at the /GVC/ structure in the following tableau using the same constraints as in tableau (17)

(18) /GVC/ output geminate structures in KD

/ʂᵘak/	ONS	Ident-weight-IO	ConsPeak	*Min-σ	*Gem
☞ a. ʂᵘak					*
b. ʂᵘa.(kᵘ)				*!	*
c. ʂᵘa.k			*!		*
d. ʂᵘ.ak	*!				*
e. sak		*!			

Tableau (18) displays that the geminate structures /GV.CVC/ and /GVC/ have the same ranking of constraints. However, they are dissimilar to the /GV.CV/ structure due to the constraint *Min-σ that prevents minor syllables. Thus, our expectation about the optimal candidates is accurate.

From the data we observed, it has been shown that geminate occurs after full vowels in the initial position. Interestingly, the same data show that geminate occurs after a weak vowel (schwa). Consider the data below:

(b)

French	KD	Gloss
saʁ.din	s.sər.din	'Sardine'
sɛ̃.tyʁ	ṣ.ṣəm.ṭa	'Belt'
sɛr.vis	s.sər.bis	'Service'

As shown above, a geminate consonant occurs next to a schwa. Contrary to previous accounts, geminates appear adjacent to full vowels. However, the pattern of geminate is not the same. In fact, the syllable where geminates take place in data (a) is always followed by a full vowel without any consonant in the coda. However, in data (b) geminates occur in the syllable where the schwa must be followed by a consonant in the coda. This implies that there is an active constraint that hinders the schwa to occur in open syllables. Let us consider the tableau below to find out more about this phenomenon:

(19)

/sᵘər.bis/	Ident-weight-IO	*Gem
☞ a. sᵘər.bis		*
☜ b. sᵘə.rbis		*
c. sɛr.vis	*!	

The promising optimal candidate (19a) does not surface as a winner. Indeed, it is in a tie with the candidate (19b). This means that there is another constraint that must be present in the tableau to block candidate (19b) to be optimal. Let us go back to what Boudlal and Bensoukas (2012) refer to as moraic schwa (*μ/ə), which is prohibited in MA. Look at the following tableau:

(20)

/sᵘər.bis/	*μ/ə	Ident-weight-IO	*Gem
☞ a. sᵘər.bis			*
b. sᵘə.rbis	*!		*
c. sɛr.vis		*!	

The ranking in the tableau above derives the correct optimal candidate (20a), which satisfies the higher-ranked constraint. Candidate (20b) is ruled out because schwa cannot bear a mora in MA. It seems that this collected data from KD provide empirical evidence that supports the claim of Boudlal and Bensoukas (2012) regarding the prohibition of moraic schwa. Another piece of evidence comes from the optimal candidate, as seen in tableau (20), where there is a consonant in the coda of the first syllable next to schwa. In fact, the consonant in the coda position in MA is moraic (see Noamane, 2019).[3] Therefore, schwa cannot bear a mora, but the consonant next to the schwa has a mora. Thus, in MA, the initial geminate adjacent to schwa can only be surfaced when there is a coda in the syllable containing a schwa. There is another potential candidate that can emerge as optimal. Consider the following tableau:

(21)

/sᵘər.bis/	*μ/ə	Ident-weight-IO	*Gem
☞ a. sᵘər.bis			*
b. sᵘə.rbis	*!		*
c. sɛr.vis		*!	
☜ d. sᵘər.bi.s			*

[3] For instance, the French words 'la barre' is borrowed to MA as (bar.ra), by geminating the coda and lengthening it to the final syllable to avoid onsetless syllable.

As shown in the tableau above, candidates (21a) and (21d) are in a tie. This problem has already been solved by the constraint (ConsPeak) that bans consonants from serving a syllable as its peak. However, two potential candidates can emerge as optimal such as sᵘər.bi.(sᵘ) and sᵘ.ər.bi.(sᵘ). These potential candidates, besides the one in a tie with the winner, are ruled out by the constraints that are used in tableau (18) along with the undominated constraint in tableau (21). The following tableau shows all the constraints used in the initial geminates followed by full vowels and the initial geminate followed by a schwa. This final ranking of constraints provides us with attested initial geminates in KD.

(22)

/sᵘər.bis/	ONS	*μ/ə	Ident-weight-IO	ConsPeak	*Min-σ	*Gem
☞ a. sᵘər.bis						*
b. sᵘə.rbis		*!				*
c. sɛr.vis			*!			
d. sᵘər.bi.s				*!		*
e. sᵘə.rbi.(sᵘ)					*!	*
f. sᵘ.ər.bi.(sᵘ)	*!				*	*

As shown in the last tableau, the two lower-ranked constraints militate against the winner, namely *Gem. All potential candidates are excluded as they incur violations of higher-ranked constraints, but the promised winner incurs minimal violations of the lower-ranked constraints. Thus, the harmonic candidate indicates that KD has inherent initial geminates. Along the same lines, Noamane (2019) and Hayes (1989) have the same claim regarding this phenomenon. The final ranking of constraints that is efficient in generating the correct harmonic output as far as initial geminates in KD are concerned is as follows:
ONS,* μ /ə, Ident-weight-IO>> ConsPeak,*Min-σ, *GEM

4. Conclusion

This paper examined French nominal loanwords' initial gemination in KD. We examined French loanwords adapted to KD that have initial geminates as a case study to show the interactions between constraints within the optimality theory framework. It has been noted that moraic geminates in KD exist. This present study has confirmed previous findings and contributed additional evidence that suggests that initial geminates in MA are inherently moraic. Moreover, the article has provided that geminates occur next to full vowels. Interestingly, an unexpected case arose as geminates appeared next to a schwa. It has been observed that schwa should not be ahead of a monosyllabic word as it is prohibited because it is not moraic; furthermore, it is observed that when geminates occur adjacent to a schwa, a coda should be presented in the geminates syllable where it supports the schwa because geminates and schwa cannot form a syllable. Also, the article established the attested final ranking of constraints of the initial geminates in KD. Finally, one limitation of this study is that it only analyzed French loanwords in KD. Consequently, further research should focus on different Moroccan varieties or Standard Arabic to determine the nature of initial geminates in MA, whether it is moraic or not.

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Author Biography: Doctoral student, Faculty of Languages, Letters, and Arts, English department, Ibn Tofail University, Kenitra, Morocco. My main areas of interest are phonology, generative phonology, Moroccan Arabic phonology, and phonetics.

References

[1] Bensoukas, K., & Boudlal, A. (2012). The prosody of Moroccan Amazigh and Moroccan Arabic: Similarities in the phonology of schwa. *Prosody matters: essays in honor of Lisa Selkirk,* 3-42.
[2] Boudlal, A. (2001). *Constraint interaction in the phonology and morphology of Casablanca Moroccan Arabic* [Doctoral dissertation, The State University of New Jersey]. Rutgers University Libraries.
[3] Campbell, L. (2013). *Historical linguistics*. Edinburgh University Press.
[4] Davis, S., & Ragheb, M. (2014*). Geminate representation in Arabic. Perspectives on Arabic linguistics XXIV-XXV, 1,* 3-19.
[5] Hayes, B. (1989). Compensatory lengthening in moraic phonology. *Linguistic inquiry, 20*(2), 253-306. https://www.jstor.org/stable/4178626
[6] Kar, S. (2010). *Syllable structure of Bangla: An optimality-theoretic approach. Cambridge Scholars Publishing.*

[7] *Kaye, A. S. (2005). Gemination in English. English Today, 21(2), 43-55*. https://doi.org/10.1017/S0266078405002063
[8] Kraehenmann, A., & Jaeger, M. (2003). *Phrase-initial geminate stops: articulatory evidence for phonological representation*. *Proceedings of the 15th International Conference of the Phonetic Sciences* (pp. 2725-2728).
[9] Louriz, N. (2012). *Adaptation of Tashlhiyt onsetless syllables in Moroccan Arabic*. *Langues et Littératures, 22,* 223-259
[10] Leben, W. R. (1980). *A metrical analysis of length*. *Linguistic Inquiry*, *11*(3), 497-509.
[11] Alkhuli, M. A. (2000). *Comparative linguistics: English and Arabic.* Dar Alfalah.
[12] Miller, Jim, E., and E. K. Brown. *The Cambridge dictionary of linguistics*. Cambridge University Press.
[13] McCarthy, J. J. (1986). *OCP effects: Gemination and antigemination*. *Linguistic inquiry*, *17(*2), 207-263.
[14] Morén, B. (1999). *Distinctiveness, coercion, and sonority: A unified theory of weight* [Doctoral dissertation, University of Maryland]. Rutgers Optimality Archive.
[15] Mubarak, A. S., & Jebur, L. A. B. (2018). *The Phenomenon of gemination in English and Arabic*. *British Journal of English Linguistics*, *6*(5), 28-37.
[16] Noamane, A. (2020). Consonant *g*emination in Moroccan Arabic: A constraint-based analysis. *Journal of Applied Language and Culture Studies, 3,* 37-68.
[17] Noamane, A. (2019). The moraic nature of geminate consonants in Moroccan Arabic: Evidence from word-minimality, syllable structure, and word formation. *International Journal of Arabic Linguistics, 5*(2), 100-129.
[18] Oh, G. E., & Redford, M. A. (2012). The production and phonetic representation of fake geminates in English. *Journal of phonetics, 40*(1), 82-91. *https://doi.org/10.1016/j.wocn.2011.08.003*
[19] Ridouane, R. (2010). Geminates at the junction of phonetics and phonology. *Laboratory phonology, 10*, 61-90.
[20] Smirkou. A. (2020). Sonority principle in French nominal loanwords into Moroccan Arabic: An optimality-theoretic analysis. *International Journal of Linguistics, Literature, and Translation, 3*(10), 54-68. https://doi.org/10.32996/ijllt.2020.3.10.7
[21] Sayahi, L. (2005). *Phonological adaptation of Spanish loanwords in northern Moroccan Arabic*. *University of Pennsylvania Working Papers in Linguistics*, *11*(1), 253-263
[22] Silverman, D. (1992). *Multiple scansions in loanword phonology: Evidence from Cantonese*. *Phonology, 9*, 289-328.
[23] Smolensky, P., & Prince, A. (1993). *Optimality theory: Constraint interaction in generative grammar*. John Wiley & Sons.
[24] Zeroual, C., Gafos, D., Hoole, P., & Esling, J. (2012). *Physiological and acoustic study of word initial post-lexical gemination in Moroccan Arabic*. *Thirteenth Annual Conference of the International Speech Communication Association*.