



Minor Syllables in Moroccan Arabic: Evidence from a Secret Language in Kenitra Dialect

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Abstract: This paper investigates the existence and behavior of minor syllables in Moroccan Arabic (MA) through data drawn from a secret language (SL) used by speakers of the Kenitra dialect. Specifically, it examines the placement of the dummy infix (DI) -akun- and its role in confirming the prosodic structure of MA. Drawing on Optimality Theory (OT), the analysis shows that the DI consistently targets the first vowel of the stem and is never inserted after a minor syllable, which lacks a vowel. The findings challenge previous studies that propose segments such as /ʕ/ can occupy syllabic nuclei, arguing instead that such segments function as onsets. This study supports earlier claims that MA permits minor syllables. Accordingly, this paper provides phonological evidence supporting the existence of minor syllables in MA and shows that they cannot serve as suitable hosts for infixation processes. The constraint Affix-to-First-Vowel is at play to ensure that DI appears before the first vowel of the stem rather than attaching to a minor syllable.

Keywords: Moroccan Arabic, minor syllables, secret language, infixation

المقاطع الصغرى في العربية المغربية: دلائل من لغة سرية في لهجة القنيطرة

د. سائد رافي

الملخص: تبحث هذه الورقة في وجود وسلوك المقاطع الصغرى في العربية المغربية من خلال بيانات مأخوذة من لغة سرية يستعملها متحدثو لهجة القنيطرة. على وجه التحديد، تفحص الدراسة موضع اللاحقة الوهمية -akun- ودورها في تأكيد البنية الإيقاعية للعربية المغربية. بالاعتماد على نظرية الأمثلية (Optimality Theory)، يُظهر التحليل أن اللاحقة الوهمية تستهدف باستمرار أول حركة في ساق الكلمة، ولا تُدرج أبداً بعد مقطع صغرى يفتقر إلى حركة. تتحدى النتائج دراسات سابقة اقترحت أن مقاطع مثل /ʕ/ قد تشغل نوى مقطعية، إذ تؤكد هذه الدراسة بدلاً من ذلك أن مثل هذه المقاطع تعمل كبدائيات (onsets). تدعم النتائج الادعاءات السابقة بأن العربية المغربية تسمح بوجود المقاطع الصغرى، وتقدم دليلاً فونولوجياً يثبت ذلك.

الكلمات المفتاحية: العربية المغربية، المقاطع الصغرى، نظرية الأمثلية، اللغة السرية، الإلحاق الوهمي، بنية المقط.

I. Introduction

MA has been the subject of extensive phonological study, particularly regarding syllable structures. Many researchers argue that minor syllables made up of a single consonant in MA satisfy foot binarity. Therefore, this paper builds on these accounts by drawing on data from a secret language used by speakers to conceal their speech. The analysis highlights a key finding: although minor syllables do occur in MA, they do not host infixes. Using data from the SL, we demonstrate that the DI consistently appears before the first vowel of the stem. This suggests that the infixation site is constrained by syllable structure in MA. The paper also revisits ongoing debates about the role of consonantal nuclei and schwa epenthesis, reinforcing the view that MA avoids complex onsets and codas through predictable phonological strategies. This study provides a new perspective on the phonology and morphology of MA, illustrating how even informal linguistic systems (secret languages) conform to systematic patterns.

II. Theoretical framework

Since OT has become central in phonological and morphological studies, it offers insights into both language universals and differences by explaining how languages use different strategies to avoid undesirable structures.

McCarthy and Prince (2004) outline five key principles of OT:

- Universality: All languages draw from the same set of constraints (Con).
- Violability: Constraints can be violated if higher-ranked ones are satisfied.
- Ranking: Constraints are ordered differently in each language.
- Inclusiveness: A set of possible output candidates is evaluated.
- Parallelism: All candidates are evaluated at once across the full constraint hierarchy.

OT consists of three main components:

Lexicon – Contains the morphemes and words.

GEN (Generator) – Produces all possible outputs for a given input. This reflects the idea of "richness of the base," meaning that any input is possible, and GEN is free to generate any output.

EVAL (Evaluator) – Compares all candidate outputs and selects the optimal one based on the ranked constraints. The goal is to find the output with the fewest violations of the most important constraints.

Constraints in OT are of three main types:

- Faithfulness constraints – Require outputs to preserve aspects of the input.
- Markedness constraints – Push for well-formed, simplified outputs.
- Alignment constraints – Ensure proper alignment of linguistic elements (e.g., morphemes and syllables).

An OT tableau visually represents how candidates are assessed. For a given input, GEN produces several possible outputs (candidates). Each candidate is evaluated against the ranked constraints. Asterisks (*) indicate constraint violations, and an exclamation mark (!) shows a fatal violation that disqualifies the candidate. The optimal candidate (marked with a pointing finger, \Rightarrow) is the one that best satisfies the hierarchy, avoiding fatal violations and minimizing others.

III. Previous accounts of minor syllables in Moroccan Arabic

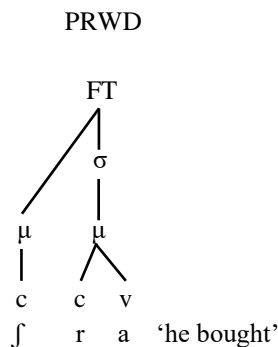
There is a large body of literature regarding syllables in MA. Most Moroccan scholars (e.g., Boudlal, Al Ghadi) agree that minor syllables in MA exist as a result of satisfying foot binarity (Boudlal, Al Ghadi, et al). Al Ghadi (1994) claims that the minimal prosodic word in MA consists of two moras, considering the initial and final consonants of a cluster as a degenerate syllable. In the same vein, Selkirk (1980) states that degenerate syllables violate the Strict Layer Hypothesis (SLH), a principle that governs the relationship between hierarchically arranged layers of prosodic structure. The presentation below illustrates this hierarchy:

(1)



Al Ghadi (1994) adopts the same approach with respect to Selkirk's claim by assigning moras to degenerate syllables. This can be seen below:

(2)



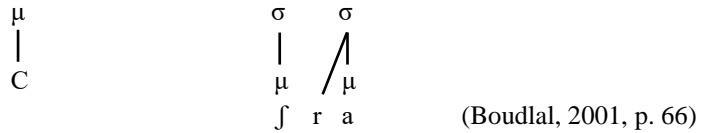
In view of the fact that MA does not allow complex margins, the first consonant is branched from the foot. Note that the word *fra* satisfies the minimal word requirement in MA, as it contains two moras. This supports the fact that Moroccan Arabic does not permit lexical items bearing only one mora. Consequently, the first consonant of the cluster, which is /f/ in the word *fra* is moraic.

In line with McCarthy and Prince (1995), languages resort to augmentation to satisfy foot binarity. Boudlal (2001) presents a thorough account of how foot binarity is satisfied by treating the first consonant of a cluster as a minor syllable. He distinguishes two types of syllables in Moroccan Arabic: a major syllable, which contains a full vowel, and a minor syllable, which consists of a single consonant. This approach satisfies the SLH as the hierarchical prosodic structure is maintained. By way of illustration, consider the following representation:

The minor syllable in MA

(3)





Although the majority of Moroccan scholars claim that minor and degenerate syllables exist in MA, as previously discussed in this paper, Louriz (2019) treats the first consonant of a cluster as a nucleus. Her analysis is based on an utterance produced by a female speaker at a slow pace, as illustrated in the example below:

(4)

huma	keʃgəlsu	ʃ	ssnaɗq	ʃi	wħdin
huma	Ka+i+gəls+u	ʃla	s-snaɗəq	ʃi	wəħd+in
They	prog+sit+3rd pl	on	crates (broken pl)	some	one+pl
people sit on crates					

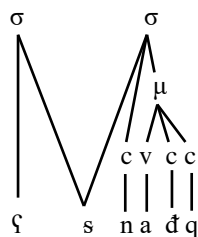
(Louriz, 2019, p. 5)

The following excerpt reflects Louriz’s (2019, p. 5) analysis:

As one proceeds in the analysis, syllable boundaries become unclear. Notice that the vowel and the preceding consonant are deleted in /ʃla/ resulting in [ʃ] only. This becomes subject to re-syllabification: [ʃssnaɗq] starts with a cluster of four consonants. PRAAT analysis confirms the lack of any vocalic element splitting these consonants, which makes it a challenging case to current models of syllabification. Also, given that the geminate /ss/ cannot be separated, schwa is expected to be inserted between /ʃ/ and /ss/ and produced like [ʃəs.sna.ɗəq], but the speaker chooses not to do so. Such a case is neither predicted nor resolved by current approaches to syllabification in MA. The one that allows onsets to consist of maximally two consonants will be faced with an over-sized onset, whereas the other that resorts to minor syllable will have a series of three minor syllables preceding the main one. A flexible account that allows syllabic consonants is required. Thus, an alternative analysis would be one that considers /ʃ/ as the nucleus of the first syllable and the geminate /ss/ to be ambisyllabic.

Let us now represent how the syllabification of [ʃs.snaɗq] ‘on crates’ is according to Louriz’s account.

(5)



It is worth mentioning that similar patterns, such as [mb.ɣaw.ʃi.xliw.nan.dx.lu.li.ha]1 ‘They did not let us get in’ is analyzed in the same way as in (5), assigning the first consonant to a nucleus [3]. Although Louriz’s approach provides a valuable analysis for the syllabification in MA, the final consonant cluster in the coda remains complex. The last two consonants in (5) are branched from the same node, which is the coda allowing complex margins. To maintain a consistent analysis with the work of Boudlal (2001) and others, providing ample evidence that the first consonant is a minor syllable and not a nucleus. This study introduces a new perspective based on data from a secret language in the section that follows.

IV. Data presentation and analysis

Before addressing this section, it is necessary to highlight that the speakers of this SL insert the schwa vowel between /ʃ/ and the geminate word /ss/ in [ʃs.s.naɖq]. Building on this, this section offers the formation of the SL under study and the syllabification patterns it reveals accordingly. It has been observed that the syllabification of this SL does not allow onsetless syllables, and that the DI is never inserted into minor syllables but always before the first vowel syllable of the stem.

A secret language is defined as a medium of communication that orally modifies a natural language to make the language difficult to decipher for a third party (Berjaoui, 2010). The formation of this SL is as follows:

(6)

a.

		-akun-	
		↓	
Saʃid	→	S- akun -aʃid	‘Said’
sir	→	s- akun -ir	‘go’
taɓla	→	t- akun -aɓla	‘a table’
ʃəzra	→	ʃ- akun -əzra	‘a tree’
qərʃa	→	q- akun -ərʃa	‘a bottle’
kas	→	k- akun -as	‘a cup’

b.

ħrəʃ	→	ħ.ra.ku.nəʃ	‘rough’
ka-j-q.ɾa-w	→	ka-j-q.ɾa.ku.na-w	‘they did not study’
bka	→	b.ka.ku.na	‘he cried’
ktəb	→	k.ta.ku.nəb	‘he wrote’
twaħʃtək	→	t.wa.ku.na.həʃ.tək	‘I missed you’

The dataset in 6a shows that the infix *-akun-* is infixed directly after the first consonant of the stem and the vowel. However, it has been shown that the DI in this SL targets the major syllable rather than the minor one, as shown in 6b. Although mostly uneducated people in Morocco create this type of SL, their formation is not random. It is the phonology of the language that governs the pattern of such SLs.

Based on the attested outputs in 6a,b, it is evident that the DI is infixed before the first vowel of the stem and after the second consonant of the onset. For the unattested forms drawn from the same data in 6b, consider the following examples:

(7)

ħrəʃ	→	ħa.kun.rəʃ*	‘rough’
ka-j-q.ɾa-w	→	ka-j-q.a.kun.ɾa-w*	‘they did not study’
bka	→	ba.kun.ka*	‘he cried’
ktəb	→	ka.kun.təb*	‘he wrote’

¹ For details, see Louriz (2019).

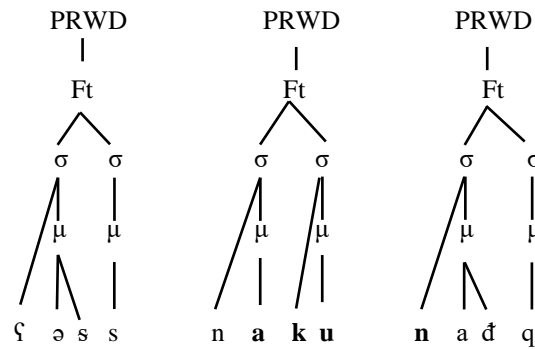
twahʃtək → ta.ku.naw.həʃ.tək* ‘I missed you’

It appears that the DI formulated by the speakers is not unsystematic since it starts with the vowel **-a...n-** and ends with a consonant. This can be explained by the fact that MA does not allow onsetless syllables (Boudlal, 2001). By way of illustration, consider the representation below:

(8) ktəb → kt-akun-əb → k.[t]a.ku.[n]əb

/t/ is attached to the vowel of the DI to satisfy the onsetless syllable. Similarly, /n/ of the DI is assigned to the schwa to satisfy the onsetless syllable. We now turn to Louriz’s data to examine how the word [ʃs.s.naḏq] is syllabified in our proposed SL. illustrative examples of this case are presented below:

(9) ʃs.s.naḏq → a. ʃəs.s.na.ku.naḏq, or



It becomes clear that no segment is left unparsed. Schwa epenthesis between the first two consonants [ʃ] and [s] allows their parsing into a syllable. Moreover, the second segment of the geminate [s] and the segment /q/ at the leftmost edge of the syllable are considered minor syllables to avoid having complex codas. This aligns with Mrhar and Smirkou’s (2024) proposal². The authors refine the traditional view that epenthesis exists merely to break complex consonant clusters. They claim that complex syllable margins are avoided by allowing minor syllables. They maintain that the main role of schwa epenthesis in MA is to ensure that all consonants are parsed into syllable structures.

The dataset we provided supports the same claim. Notice that the vowel schwa is inserted between [ʃ] and the geminate [s] in (number), which allows their parsing into a syllable. This shows that schwa epenthesis is triggered by the need to parse consonantal segments. The segments /s/ (the second of the geminate) and /q/, on the other hand, are parsed as minor syllables to avoid having complex codas. Therefore, allowing minor syllables is motivated by the need to satisfy the constraint *COMPLEX.

The following subsection provides an optimality-theoretic analysis to account for the placement of DI. It is meant to illustrate the constraint ranking that explains the reason why attaching the DI to the minor syllable provides ill-formed outputs.

V. An OT Analysis of DI Infixation

To account for Minor syllables and the placement of the DI in this dialect, we need both markedness and faithfulness constraints. These constraints are given below:

- (10) a. **Onset (ONS)**: (Prince & Smolensky, 1993/2004): Every syllable must have onsets.

² For further details on this point, see Mrhar and Smirkou (2024)

- b. **Affix-to-First-Vowel** (Yu, 2007): Align (R, **akun**; L, First Root Vowel)
- c. **DEP-IO**: No phonological epenthesis (McCarthy & Prince, 1995)
- d. ***Min-σ**: Minor syllables are prohibited (Boudlal, 2001)
- e. ***COMPLEX-MARGIN** (henceforth ***COMPLEX**): Codas and onsets must not branch (Prince and Smolensky 1993)
- f. **Parse-seg**: requires segments to be parsed into syllables (Prince and Smolensky, 1993)

Since MA does not allow complex syllable margins, unparsed segments, and onsetless syllables, the constraints *complex, unparsed segments, and ONS are deemed to be undominated. Given that DI is always attached to the first vowel of the stem, the constraint Affix-to-First-V is also claimed to be undominated³. It has been shown from the MA data that epenthesis and minor syllables are allowed. Therefore, Dep-IO and *Min-σ are dominated. Mrhar and Smirkou (2024) examine the ranking of the constraint *Min-σ regarding the anti-epenthesis constraint DEP-IO. They argue that MA permits violations of both DEP-IO and *Min-σ to satisfy undominated constraints. Specifically, DEP-IO is violated in favor of fulfilling PARSEseg, while *Min-σ is violated to satisfy *COMPLEX. Although satisfying *COMPLEX could be achieved through inserting multiple epenthetic vowels, MA tends to prefer minor syllables over excessive epenthesis, as illustrated by the example /ktb-t/ realized as [.k.teb.t.] rather than [.kət.bət.] ('I wrote'). Consequently, DEP-IO must outrank *Min-σ. Accordingly, the proposed ranking in (12) ensures the emergence of the optimal attested output.

(11) Affix-to-First-Vowel, Onset, *Complex >> Dep-IO >> *Min-σ

(12)

/akun, ʕssnađq/	Affix-to-First-Vowel	Parse-seg	Onset	*Complex	Dep-IO	*Min-σ
a. ʕəs.s.na.ku.nađq					*	**
b. ʕss.na.ku.na.đq		*!***		*!		
c. ʕa.ku.nəs.s.na.đəq	*!				**	*
d. ak.un.ʕs.s.nađq	*!	**	*			*

Given the constraints in this tableau, the optimal output is candidate (a), which violates lower-ranked constraints. This outcome is consistent with the core principles of OT, where constraints are violable but should be minimally violated. Candidate (b), proposed in Louriz's analysis, is ruled out due to a fatal violation of parse-seg, a higher-ranked constraint. It would have been sufficient to note that parse-seg and *complex rule out her attested output since the speakers in our data opt for schwa epenthesis. Additionally, her model could have benefited from incorporating the minor syllable account proposed by Boudlal (2001). Moreover, the epenthesis of the schwa between /ʕ/ and the ambisyllabic /s/ facilitates the formation of this secret language. Candidates (c) and (d) would never surface as optimal outputs as they violate the constraint forcing the DI to be inserted before the first vowel of the stem. In addition, the DI cannot be attached to a minor syllable. A fact which points out that the Affix to First Vowel constraint forces the DI to target major syllables since Minor syllables

³ I sincerely thank Professor Boudlal for his constructive remarks on my previous analysis of constraint interaction, which led to significant improvements in the present article.

do not have full vowels and nuclei or a schwa followed by a consonant that forms a syllable.

VI. Conclusion

The present paper has not only provided us with the existence of Minor syllables in which the DI cannot attach to, but it has also shown that the DI should be attached to the first vowel of the stem, which only major syllables have. We have argued that /ʎ/ cannot occupy the nucleus of syllables since the analysis we have provided considers /ʎ/ as the onset of the first syllable, either by assigning it to the onset of the DI *-akun-* or by breaking the cluster of a consonant and a geminate, such as (ʎəss) which speakers tend to opt for while formulating the SL. Although the former is unattested in our data because it violates the Affix to First Vowel constraint, /ʎ/ can never occur in the nucleus in our case. The study concluded by asserting that the insertion of the DI consistently takes place before the first vowel of the stem. We argued that the dummy infix cannot attach to a single consonant lacking a vowel, as observed in cases involving minor syllables. The previous model overlooks complex codas and does not explain why certain forms, such as complex margins, emerge as harmonic outputs.. Contrary to our findings, they contribute to the understanding of syllabification in MA and highlight the importance of prosodic structure in morphophonological processes.

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