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International Journal of Linguistics
ISSN 1948-5425
2022, Vol. 14, No. 6

Moroccan Arabic Consonant Clusters Resulting From Negation as an Exception to Benhallam's SSAA: An Optimality-Theoretic Account

Radouane Belkhadir

Faculty of Languages Letters and Art, University Ibn Tofail, Kenitra, Morocco

E-mail: belkhadirred1970@gmail.com

Received: November 5, 2022 Accepted: November 28, 2022 Published: December 21, 2022

doi:10.5296/ijl.v14i6.20593 URL: https://doi.org/10.5296/ijl.v14i6.20593

Abstract

This article examines the status of the consonant cluster resulting after the concatenation of the discontinuous plural morpheme ma…….ʃ. In disconformity with Benhallam's Syllable structure Assignment Algorithm (henceforth SSAA) which predicts that every succession of consonants is resolved in MA by inserting schwa to break hiatus, the succession of consonants after the abovementioned morphological operation does not permit schwa epenthesis. As such, it is imperative to account for the status of the final consonants and incorporate them into the syllable structure of the language. The claim of this article is that schwa is not inserted here as the ʃ of the negative morpheme is assigned an appendix which is moraless. So, it cannot make a mora in combination with the moraless schwa. The analysis is couched within the framework of Optimality Theory (OT). More specifically, the constraints that interact to account for this seeming ad hoc are both faithfulness and markedness constraints. It is argued that some faithfuness as well as markedness constraints interacting with each other are responsible for the existence of such consonant clusters.

Keywords: Moroccan Arabic, Optimality Theory, Syllable Structure Assignment Algorithm

1. Introduction

Benhallam (1990) introduced the Syllable Structure Assignment Algorithm (Hence SSAA) which predicts that the vowel Schwa is inserted whenever a succession of consonants occurs to break hiatus. Epenthesis takes place from right to left after full vowel syllabification to the effect that no consonant cluster remains unparsed. Following the same line of reasoning, but from a constraint-based perspective, Boudlal (2001) claims that it is the constraint parse-seg that regulates the insertion of schwa as this vowel is epenthesized to help parse into the prosodic hierarchy any unsyllabified consonant succession. This claim as proposed by both scholars didn't account for some cc clusters occuring in MA, especially after some morphological operations. One of these operations is the negative morpheme /ma………ʃ/. For instance, this morpheme is added to verbs to express negation. An example is a word such as 'malɛəbtʃ', meaning 'I didn't play'. After a quick look at the derived form after negation, one notices the succession of two consonants word-finally, namely, t- (I- morpheme) and –ʃ (part of the negation morpheme).This succession seems to be a challenge for Benhallam's SSAA since no schwa is inserted to break the consonant succession. And to the best of my knowledge, no attempt has been made to account for such a seeming problem for Benhallam's SSAA.

In the present article I defend the viewpoint that schwa cannot be inserted here as the ʃ of the negative morpheme is assigned an appendix which doesn't carry any moraic specification. And since schwa is also moraless, and does not get its moraic specification unless it is added to a consonant, it is impossible to insert it in this context. The account I propose is couched within OT as advanced in McCarthy and Prince (1993), Prince and Smolensky (1993) and other works. More specifically, I claim that the ranking of some well-formedness constraints, faithfulness contraints, and others pertaining to moraic theory (Broselow 1990; Hayes 1989; Hyman 1985; Katada 1990; Moren 1999; Pulleyblank 1994; Rosenthall 1994; Selkirk 1990), are responsible for blocking the schwa insertion in the context of negation as presented above.

The remainder of this article is outlined as follows. Section two gives a succinct overview of previous accounts to schwa insertion, namely, Benhallam (1989, 1990) and Boudlal (2001). Section three attempts a critical overview of both accounts. The fourth section presents succinctly the theoretical framework. The fifth section is a presentation of the alternative account. The last one summarizes the article.

2. Accounts of Schwa Insertion

2.1 Benhallam (1989/1990)

For Benhallam words that have schwa at the surface form are treated in a special way. He posits that schwa occurs in a predictable environment; it is inserted between every succession of two consonants from right to left. Examples are words like: Drəb, Dərbək, təktəblək, etc. From this claim Benhallam hypothesizes that schwa is epenthetic in MA. For example, to syllabify a word like (sfr+a) meaning 'yellow', the SSAA will assign an onset position to the first syllable. And the other two consonants make the environment for schwa insertion. In other terms, words that have full vowels are assigned their syllable structure by the SSAA and unassigned consonants will be assigned syllable structure in the following fashion:

1- Unassigned Consonants Rule

Assign every sequence of two consonants the canonical structure shape as follows:

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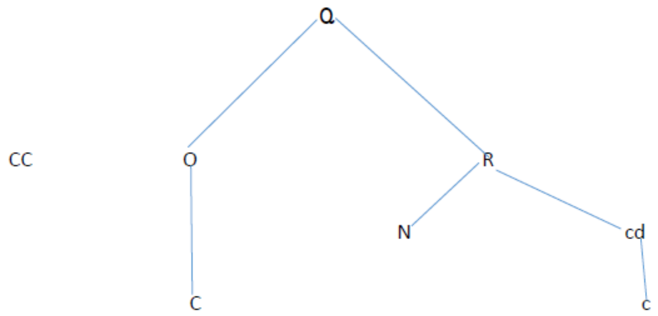
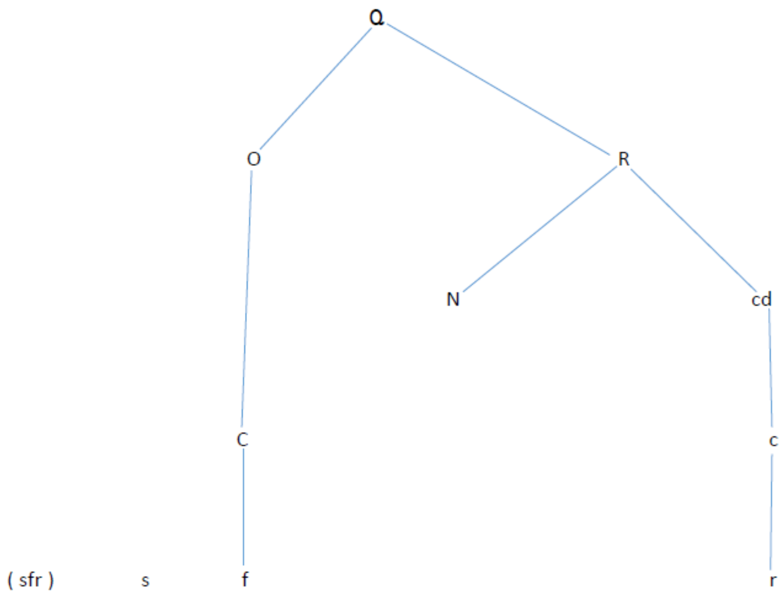


A root like (sfr) will be assigned the following structure:



A rule of eprnthesis will fill the empty nucleus with a schwa:

EPENTHESIS	N	N
		V
	Q	∂

2.2 Boudlal's Acconnt (2001):

Like Benhallam (IBID), Boudlal (2001) assumes that schwa is not part of the underlying representation. It is, however, inserted in violation of DEP-IO to respect the higher-ranked constraint ONSET. As SSAA goes, first core syllables are built. An item such as CCCV is syllabified as CC.CV. Later, syllable rules assign the first two consonants a syllable which nucleus is schwa.

Boudlal (IBID) assumes that schwa epenthesis is a violation of DEP-IO to satisfy a dominating constraint PARSE-SEG, necessitating that all constituents must be assigned a syllable structure.

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Prince and Smolensky (1993) states this constraint as follows:

PARSE-SEGMENT (parse-seg)

Every segment must belong to a syllable.

Another constraint at play in MA is MAX-IO which necessitates that all segments must be realized in the output. Boudlal (IBID) assumes that MAX-IO and PARSE-SEG dominate DEP-IO.

For an input such as (katb) the following tableau shows its derivation.

/ katb/	MAX-IO	Parse-seg	DEP-IO
a-ka.təb. →			*
b-ka.tb		** !	
c-ka	** !		
d- ka.tə.b.ə		** !	

Candidate d is ruled out as it incurs two violations of DEP-IO. C is considered suboptimal since two of the constituents in the input do not show up in the output, a double violation of MAX-IO. Candidate b also loses the race because it witnesses a violation of the high-ranked constraint PARSE-SEG. The last candidate a is the winner as long as it incurs a violation of the lower-ranked constraint DEP-IO.

2.3 Critical Review of Previous Accounts

The SSAA proposed by Benhallam above fails to account for many forms in MA. One of these forms are words containing schwa as one of their vowels. The Algorithm seems accountable as long as no morphological operation applies. For instance, for trilateral words as ktb, a schwa is inserted between c2 and c3 from right to left, which is applicable to words as brək, sməɛ, lɛəb and others. Quadrilateral words also apply by the Algorithm. An example are words like ‘kərkəb’ meaning ‘to roll’. Schwa is inserted from right to left to yield the attested form. But once some morphological operations apply, we start encountering some problems. For example, in a word like ktəb, schwa is inserted between c2 and c3 in compliance with the SSAA. If the morpheme –t (I subject) is added to the word, the principle of cyclicity proposed by Benhallam yields the correct form, namely ktəbt. Schwa is inserted in the first cycle, which blocks the epenthesis of another schwa as its context no more shows up. But what about words to which we add the prefix –t meaning ‘she’ to the same root? As far as the SSAA is concerned, the output will be * ktəbt meaning ‘she wrote’, wheras it means ‘I wrote’.

More than that, there are instances in MA where the site of schwa insertion is there, but cc occurs in the language. An example is instances when the plural morpheme ma……….ʃ is concatenated to verbs. For instance, to express negation with a word like ‘ktəbt’ ‘I wrote’, we get the following form ‘maktəbtʃ’. Other examples are: ‘manɛəstʃ’ ‘I didn’t sleep’, ‘maʃəftʃ’ I didn’t see’, ‘maʒbədtʃ’ ‘I didn’t take out’ etc. Here the last two consonants the ‘I’ person –t and the –ʃ of the negative morpheme make environment for schwa insertion, as advanced by Benhallm’s SSAA. However, no schwa is inserted between the two consonants. This questions the adequacy of the SSAA since no account ‘as far as I know’, is proposed by Benhallam for such exceptions.

I will defend in the following sections the claim that this consonant cluster is due to the fact that the last consonant is assigned to an appendix and the insertion of a moraless schwa which gets its moraic specification from the following consonant is impossible since the appendix is also moraless. Such a seeming ad hoc for Benhallam is accounted for in this article using principles of OT and constraint ranking. For instance, I defend the viewpoint that the constraint necessitating a moraic constituency of the syllable interacts with constraints like * COMPLEX, ONSET, PARSE-SEG and others to account for this case of The Emergence of The Unmarked (TETU). As a matter of fact, the succession of consonants in this context is considered an emergence of the unmarkrd as outlined in McCarthy (1995).

3. A Sketch of OT

The inception of OT was a reaction against rule-based paradigms to overcome the problem of abstractness between the underlying and the surfacce structure as proposed in the Sound Pattern of English (hence SPE). This paradigm was introduced in McCarthy and Prince 1993 and Prince and Smolensky 1993 and subsequent works. The main tenets of this theory is that Universal Grammar is made up of universal constraints that are ranked language-specifically to yield the attested forms. Grammar for OT is constituted of two components: GEN and EVAL. GEN is endowed with the capacity to generate any set of candidates for EVAL to evaluate against markedness and faithfulness constraints. These constraints apply in a parallel fashion, which means there are no rules or repair strategies. EVAL receives the candidate set from GEN and selects the most harmonic output based on the ranking of the constraints. Let’s say that there are candidates C1 and C2 proposed by GEN and the constraints Const1 and Const2 as constraints in CON where Const1 ranks higher than Const2. Any violation of Const1 from any of the candidates is considered a fatal violation and the candidate incurring this violation is disqualified from the race. A violation of Const2 is seen as a minor violation and the candidate incurring it is considered an optimal output. The tableau below is used to explain the abovementioned ideas.

/Input/	CONS1	CONS2
CAND1	* !	
→CAND2		*

Candidate one is ruled out since it violates fatally the highly-ranked constraint CONS 1. So, cand2 wins the race since it incurs a minor violation of the low-ranked constraint CONS 2, but no violation of CONS1.

The account proposed in this article is cast within this framework in an attempt to explain the ad hoc non-insertion of schwa in the cc context which was a challenge for Benhallam's SSAA.

4. Analysis

The analysises proposed above by Benhallam (1980) and Boudlal (2001) were accountable but didn't provide an analysis for the items where consonant clusters occur in violation of the ranking given above. A case in point are items resulting from the morphological concatenation of the dicontinuous morpheme of negation ma……..ʃ. For instance, a word like /kəlt/ meaning 'I ate' is realized as follows when this morpheme is added, 'ma+kətʃ'. We notice that the concatenation of this morpheme results in consonant clusters word-finally, namely, tʃ: the –t which is the 'I' pronoun and ʃ as part of the negative morpheme.

The presence of such a consonant cluster questions the adequacy of those acoounts. To analyze such a seeming ad hoc example, I present an analysis which assumes that the ʃ part of the morpheme is assigned a moraless appendix, and if schwa is inserted in this context, we get a moraless syllable since ə itself doesn't carry any moraic specification, which is a violation of higher-ranked constraint that predicts that appendices are moraless. The same analysis is provided by Hdouch (2004) for the three consonants resulting after the concatenation of the feminine suffix /t/ the second person pronoun /d/, and the third person mas/fem object /tt/. Illustrative examples are the forms below:

a- Feminine suffix: Oino 'ankel'

b- The second person pronoun: EOCerzT 'you ploughed'

c- The third person mas/fem object clitics /tt/: ssird 'wash it' (mas)

Ssird-tt ' wash it' (fem)

As noticed above clitics give rise to triconsonantal clusters at the end of items. For Hdouch they cannot be added to to the coda cluster because the language doesn't allaow more than two consonants in this position. They are then parsed under appendix. In OT Appendices violate the constraints MAX-IO, DEP-IO, and *COMPLEX.

The constraint is as follows:

*Appendix(*App)

Appendix consonants are banned.

Schwa cannot be inserted before an appendix since it is also moraless.

Hdouch (IBID) claims that since appendices occur in AWTB as consonants word-finally, *APP is dominated by MAX-IO and DEP-IO.

Let’s consider the tableau presented in Hdouch (IBID).

/tin+t/	MAX-IO	DEP-IO	*APP
→a-OintO			*
b-Oin-	* !		
c-OinO		* !	

The first candidate is preferred since the consonant is appendixal. Candidate b is ruled out since it incurs a fatal violation of the high-ranked constraint MAX-IO. The candidate c does not win the race since the insertion of schwa violates the constraint DEP-IO. As such Hdouch provides a well-grounded account for consonant clusters using principles of OT.

If we go back to the analysis provided by Boudlal above claiming that MAX-IO and the highly-ranked constraint PARSE-SEG force the insertion of schwa since DEP-IO is ranked low in the constraint hierarchy, it wrongly predicts that a form like maktəbtəʃ is more optimal than maktəbtʃ. The constraint hierarchy advanced by Boudlal would derive the output in the table below:

/ma+ktəb+t+ʃ	MAX-IO	PARSE-seg	DEP-IO
a-maktəbtəʃ			*
b-maktəbtʃ		*!	

The ranking wrongly predicts that candidate a is the optimal output as it incurs a violation of the low-ranked constraint DEP-IO; while candidate b is ruled out as it incurs a fatal violation of PARSE-SEG.

To generate the correct output for the negative morpheme ma………..ʃ, the constraint *APP presented above gets into play. This constraint comes after DEP-IO in ranking but succeeds in deciding about the optimality of the candidate resulting after the the concatenation of the negative morpheme. Ranking this constraint lower than DEP-IO will stop the insertion of schwa with a violation of the low-ranked constraint *APP. This is, as far as I am concerned, a case of an The Umergence of The unmarked. McCarthy and Prince (1995). This case emerges when the effect of a constraint dominated in the language (DEO-IO here) can still be observed when the dominant constraint is not relevant. So, this constraint may be violated but in some contexts it is obeyed and decides as to the optimality of a certain ouput. The tableau below shows clearly the effect of DEP-IO in generating the output (maktəbtʃ) not (maktəbtəʃ).

/Ma+ʃf+t+ʃ/	MAX-IO	PARSE-SEG	DEP-IO	*APP
a-maʃəftʃ				*
b-maʃəftəʃ			* !	
c-maʃəft	* !			
d-maʃəf	** !			

Both candidates c and d are ruled out since they incur violations of MAX-IO, a highly-ranked constraint in CON. Candidate b, though it respects PARSE-SEG by inserting a schwa between the last ccs, it is not accepted since it incurs a fatal violation of DEP-IO active in this context. It is candidate a that wins the race finally by not inserting a schwa phonetcally since it does not violate DEP-IO, but incurs a violation of *APP which is low in the constraint hierarchy. This way, *APP forces the respect of the moraic theory as advanced in (v …………………………………) which necessitates a moraic constituency of any syllable. If ə is inserted here before a moraless appendix to respect the other constrants; namely, DEP-IO, there would be a violation of of another constraint which demands that every syllable have its moraic constituency.

The analysis seems pertinent in accounting for the absence of schwa in the context of consonant clusters as created by the morphological operation of negation. But this account cannot be adequate if it does not explain the status of the consonants before the ʃ part of the morpheme as these consonants would violate a constrant high in the constraint hierarchy which is * COMPLEX

*COMPLEX

This constraint ranks higher than DEP-IO. So, it would force the ungrammaticality of a form like maktebtʃ judged as the optimal output by the constraint hierarchy as proposed above.

For instance, the optimal output for an input like ‘malɛəbtʃ’ ‘I didn’t play’ will be derived as shown in the tableau below:

/ma+lɛəb+t+ʃ/	*COMPLEX	DEP-IO	*APP
Malɛəb+təʃ		*	*
malɛəbtʃ	*!		

As shown above candidate b is ruled out since it violates the gighly-ranked constraint *COMPLEX. Candidate a, on the other hand, is considered optimal, though it is the wrong output, as it incurrs a violation of the low-ranked constraint DEP-IO and *APP. This poses a problem for the analysis abovesuggested and questions its adequacy.

For cosonants making the second consonant of a coda cluster, Kiparsky (2003) advanced the principle of Semisyllables. Underlying Kiparsky's principle is The Prosodic Licencing Principle formulated by Ito 1986, 1989 which requires that every segment must belong to a higher-level prosodic constituent. In OT, as suggested by kiparsky (IBID), higer-ranked constraints may force violations of Prosodic Licencing. And cases of semisylables occur when this principle is overranked by higher markedness constraints.

The constraint violated in this context is Parse- Mora since it is overranked by * COMPLEX and the consonant can be assigned directly to a prosodic word. This is shown in the form below:

W

Q

S

μ μ μ

s e f t

Words like 'kt∂bt' are generated as follows:

/ktəb+t/	*COMPLEX	PARSE-μ
a-ktəb-t		*
b-ktəbt	!*	

Boudlal (2001) talks about minor syllables. The constraint that bans minor syllables

*Min-o: Minor syllables are prohibited

When this constraint is outranked by DEP-IO, the following ensues:

/ ʃəf+t /	Dep-IO	*Minor-Ɑ
→a-ʃəf.t		*
b-ʃəfət	* !	

In this analysis for Moroccan Arabic, I adopt Kiparsky's notion of semisyllables to account for cases of coda consonant clusters.

Going back to our constraint hierarchy proposed above for the analysis of consonant clusters resulting from the morphological operation of negation, Kparsky's principle of semisyllables comes into play. The –t morpheme is assigned a semisyllable in violation of parse-µ which ranks lower, but in respect of a higher-ranked constraint which is *COMPLEX.

For the derivation of an input like /ma+ktəb+t+ʃ/ the constraint ranking goes as follows:

/ ma+ktəbt+ʃ/	Max-IO	Parse-seg	*Complex	Dep-IO	Parse-µ	*APP
a-maktəbt.ʃ				*!		
b-maktəbt.s			*!			
c-maktəb.t.s					*	*

It is DEP-IO that decides on the optimality of the output c, and *COMPLEX is not violated since the –t 'I morpheme' is assigned a semisyllable in violation of the low-ranked constraint PARSE-µ. This way, we account for the status of both consonants resulting from the concatenation of the plural morpheme ma-…..ʃ and the –t as the 'I' pronoun. Otherwise, or more specifically, if schwa is inserted in this context, there would be a violation of the moraic theory as oulined above.

5. Conclusion

The present work was an attempt to provide an Optimality-Theoretic account to some exceptions to the SSAA as advanced by Benhallam (1990) and further developed in Boudlal (2001). More specifically, I tried to explain why an occuring cc cluster through morphological operation does not insert a schwa in compliance with the SSAA. For instance, after the morphological operation of negation using the continuous morpheme ma………ʃ, a cc cluster appears word-finally as exemplified above. Although this is the context where schwa should be inserted, the final output is a cc cluster, a clear violation of the SSAA. The hypothesis defended in this article was that schwa is not epenthesized in this context because the last consonanant ʃ is assigned to a moraless appendix and schwa is also moraless. And it does not get its moraic constituency unless it is followed by a coda with which it is assigned a mora. The inception of schwa in the context of a cc cluster resulting from the morphological operation of negation as outlined in subsequent sections would violate consraints generated by moraic theory. Hence, the schwa epenthesis is blocked thus resulting into a cc cluster which seems at first sight a violation of the SSAA algorithm as proposed by Benhallam.

I admit that the study is applicable to AMA as outlined in works as Benhallam (1990) and others, but did not extend the account to analyse the process in other variations of Moroccan Arabic such as the ones spoken in the North or South of Morocco. As such, it is advisable that more research should be carried on these variations to give more credit to the account.

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