

**THIS BOOK IS OF
POOR LEGIBILITY
DUE TO LIGHT
PRINTING
THROUGH OUT IT'S
ENTIRETY.**

**THIS IS AS
RECEIVED FROM
THE CUSTOMER.**

A GENERATIVE PHONOLOGY OF THE
MOROCCAN ARABIC VERB

by

ABDERRAFI BENHALLAM

B.A., Universite Mohammed V, Rabat, Morocco

A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF ARTS

Department of Speech

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1976

Approved by:


Major Professor

**THIS BOOK
CONTAINS
NUMEROUS PAGES
THAT WERE
BOUND WITHOUT
PAGE NUMBERS.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

LD
2668
T4
1976
B45
C.2
Document

176

ACKNOWLEDGEMENTS

I wish to thank all the members of my supervisory committee. My special thanks go to Dr. James L. Armagost without whose enlightening comments, advice and help, this work would have stayed at a much more preliminary level. I also wish to thank IIE for their financial support. Finally, I wish to thank those friends who have shown patience at difficult moments.

TABLE OF CONTENTS

	Page
INTRODUCTION	1
SECTION I: VERBS WITH UNDERLYING TRICONSONANTAL STEMS	4
A. SOUND TRICONSONANTAL STEMS	4
B. DOUBLED TRICONSONANTAL STEMS	12
SECTION II: VERBS WITH UNDERLYING QUADRICONSON- ANTAL STEMS	16
SECTION III: VERBS WITH AN UNDERLYING MEDIAL VOWEL	20
SECTION IV: VERBS WITH AN UNDERLYING FINAL VOWEL	29
CONCLUSION	35
FOOTNOTES	37
BIBLIOGRAPHY	40

Moroccan Arabic is the language spoken in the extreme northwestern part of Africa, Morocco. It is spoken by approximately eighteen million people. With this number of people speaking the language there are, obviously, dialectal variations which characterize different regions. The dialect described in this work is what might be called, broadly speaking, the Central Urban Dialect of Moroccan Arabic. This calls for a cautionary remark. Since I had to change residence from Meknes to Rabat, some changes have occurred in my dialect. These changes were by no means either voluntary or conscious. They were brought about by social constraints and impositions of what is and what is not "prestigious" speech. This, in short, is to say that the dialect described here is the Central Urban Dialect with slight variations.

More crucial to the import of this work is the background of Moroccan Arabic. Before the final quarter of the Seventh Century A.D., there was no such thing as Arabic in Morocco. What was spoken there is Berber, a Hamito-Semitic language distantly related to Arabic. The Arab invasion beginning in the late 600's introduced what was, I believe, very close to what is nowadays referred to as Standard Arabic, or Classical Arabic. This because the invaders originated from Damascus, the base of Arab civilization and culture.

Later Spain was invaded and Arabic was introduced there, too. The invaders were mainly Moroccan Berbers headed by Arab conquerors. A great deal of movement from Morocco into Spain and vice versa, as well as intermarriages between Moroccans and Spaniards, occurred at the time. In the Fifteenth Century, after the Christians gained back Spain, Spanish Jews and converted Muslims, as well as the Moroccan invaders, returned to Morocco. Finally, various European invasions into Morocco took place.

This brief sketch may hint at all the kinds of people, with their various backgrounds, that had to learn Arabic and eventually mold what will come to be known as Moroccan Arabic. This should account for the tremendous changes that the language has undergone, to the point of non-intelligibility with other dialects of Arabic.¹ Comparing grammars of Classical and Moroccan Arabic, one would expect to find many changes, additions and losses of phonological rules. As these changes might simplify the grammar of Classical Arabic, so they might also add complications. In the case of Moroccan Arabic, it seems these changes have both added complications into and simplified the grammar of the language. In the case of the consonantal stems the grammar has been simplified and in the case of the passive participle of the triliteral verbs it has been complicated.

In the first section, I will deal with triconsonantal stems; in a second section I will deal with quadriconsonantal stems; a third section will take up triliteral stems with a medial vowel; and the last section will deal with triliteral stems with a final vowel. The conclusion will summarize briefly what has been achieved in this work and point out some of the problems that have been encountered.

SECTION I

VERBS WITH UNDERLYING TRICONSONANTAL STEMS

This section will be divided into two parts. One will deal with what Harrell (1962) calls sound stems and the other with what he calls doubled stems. Sound stems are those that have three different consonants. Double stems are those that end in two geminates.

A. SOUND TRICONSONANTAL STEMS²

Consider:

1.	xdəmt	I worked
2.	xdəmti	you worked
3.	xdəm	he worked
4.	xədmət	she worked
5.	xdəmna	we worked
6.	xdəmtu	you (plural) worked
7.	xədmu	they worked

I am going to posit here a triconsonantal underlying stem, namely /xɗm/, and propose a few rules that will account for the occurrence of the vowel in the stem. As far as the suffixes are concerned, for the first and second persons singular, the underlying suffixes are going to be, respectively, /-it/ and /-iti/ although they emerge as [̚-t̚] and [̚-ti̚]. Similarly, the underlying suffixes for the first and second persons plural will be respectively /-ina/ and /-itu/, although they are realized phonetically as [̚-na̚] and [̚-tu̚]. A rule to be given below will account for the

elision of /-i/ in the relevant environments. The suffixes for the other persons are identical in underlying representation and derived form.

One might state a rule which will insert the vowel in the stem as (I).

(I) EPENTHESIS³

$$\emptyset \longrightarrow \partial / \text{CC} - \underset{\text{stem}}{\text{C}} _$$

With this rule the schwa will be inserted correctly in such items as [xɔ̃mt] and [xɔ̃mtu] . If we look at [xɔ̃mat] and [xɔ̃mu] , however, we notice that the schwa shows up between the first two consonants of the stem, not between the last two. We might hypothesize a process of metathesis triggered by the vowel immediately following the stem in these forms. Metathesis has not been triggered in items 1, 2, 5 and 6 because the rule which deletes the underlying /i/ acts earlier in the derivation. A rule which might account for the movement of the schwa could be formulated as (II).

(II) METATHESIS⁴

$$\underset{\text{stem}}{\text{[CCVC]}} \underset{1234}{\text{V}} \longrightarrow 13245$$

This rule has to be restricted to the stem so that it does not affect such vowels as the /a/ in [xɔ̃m+at+u] (she worked it).

Now that the vowel insertion is accounted for, for all

the items of the data, let us return to $\llbracket x\dot{d}\dot{a}mt \rrbracket$, $\llbracket x\dot{d}\dot{a}mti \rrbracket$, $\llbracket x\dot{d}\dot{a}mna \rrbracket$ and $\llbracket x\dot{d}\dot{a}mtu \rrbracket$. It was assumed earlier that the underlying suffixes in these four items are respectively $/-it/$, $/-iti/$, $/-ina/$ and $/-itu/$. We need a rule of Syncope that would elide the $/i/$. This rule would have to be ordered before Metathesis -- so that we do not generate ungrammatical forms as argued above. For the moment it will be stated as follows:

(III) SYNCOPE

$$i \longrightarrow \emptyset / C+ \text{---} C$$

Here is a complete derivation of the above data:

x $\dot{d}m+it$	x $\dot{d}m+at$	x $\dot{d}m+itu$	x $\dot{d}m+u$	UNDERLYING REPRESENTATION
x $\dot{d}m+t$	-----	x $\dot{d}m+tu$	-----	SYNCOPE
x $\dot{d}\dot{a}m+t$	x $\dot{d}\dot{a}m+at$	x $\dot{d}\dot{a}m+tu$	x $\dot{d}\dot{a}m+u$	EPENTHESIS
-----	x $\dot{a}dm+at$	-----	x $\dot{a}dm+u$	METATHESIS
x $\dot{d}\dot{a}mt$	x $\dot{a}dmat$	x $\dot{d}\dot{a}mtu$	x $\dot{a}dmu$	DERIVED FORM

Let us now consider the imperfective form of the same verb.

n $\dot{a}x\dot{d}\dot{a}m$	I work
t $\dot{a}x\dot{d}\dot{a}m$	you (masculine) work
tr $\dot{a}dmi$	you (feminine) work
y $\dot{a}x\dot{d}\dot{a}m$	he works
t $\dot{a}x\dot{d}\dot{a}m$	she works
nx $\dot{a}dmu$	we work
tx $\dot{a}dmu$	you (plural) work
yx $\dot{a}dmu$	they work

In addition to the stem, we have prefixes that denote the

imperfective and suffixes that denote the plural and feminine singular. The prefixes show up either as Cə- or as C-. Since the earlier occurrences of [ə] were predictable, we might ask whether the [ə] in the imperfective suffixes is likewise predictable. I am going to suggest that in the underlying representation the prefixes are of the form C- rather than Cə-, and that there is a rule of Moroccan Arabic which breaks up initial consonant clusters of more than two consonants. A second Epenthesis rule might be formulated as follows:

(IV) EPENTHESIS 2

$$\emptyset \rightarrow \text{ə} / \# \text{C} \text{ — CC}$$

This rule has to be ordered after Metathesis so that it does not apply to items such as the first and second persons plural, yielding the ungrammatical forms [*nəxədmu] and [*təxədmu]. Here is a derivation of the items under discussion:

n+xdm	t+xdm	n+xdm+u	t+xdm+u	UNDERLYING REPRESENTATION
n+xdəm	t+xdəm	n+xdəm+u	t+xdəm+u	EPENTHESIS
-----	-----	-----	-----	SYNCOPE
-----	-----	n+xədm+u	t+xədm+u	METATHESIS
nə+xdəm	tə+xdəm	-----	-----	EPENTHESIS 2
nəxdəm	təxdəm	nxədmu	txədmu	DERIVED FORMS

This analysis is a possible way of accounting for the data.⁵

But if we look at EPENTHESIS 2 we see that in some cases it

inserts the schwa in the same environment where Metathesis moves it, for instance: [xədmat] and [xədmu] . So with a little alteration in the rules we might be able to simplify the analysis. We have two Epenthesis rules separated in the rule ordering and we have an intervening Metathesis rule whose work can be done by Epenthesis 2, at least in some cases. One could, then, consider the possibility of collapsing the two Epenthesis rules and omitting the Metathesis rule. Now the crucial items, from the data considered so far, are

xəmt
 xə̃m
 xədmət
 nə̃xdə̃m
 txədmu

In the first two items we see that the schwa is inserted in the environment

$$(V) \quad C \text{---} C \begin{array}{c} \square \\ \text{stem} \end{array} \begin{array}{c} \{ \# \} \\ \{ C \} \end{array}$$

The word boundary environment will also insert the rightmost schwa in [nə̃xdə̃m] . In the items [xədmət] and [nə̃xdə̃m] the leftmost schwa is inserted in the environment $C \text{---} CCV$. In [txədmu] it is inserted in the same environment except that we have an extra C to the left of the environment, but that will not be crucial to the statement of the rule. Integrating the above environments into the rule, Epenthesis may be stated as follows:

(VI) EPENTHESIS

$$\emptyset \rightarrow \partial / C \text{ --- } C \begin{cases} \square \\ \text{stem} \\ \text{CV} \end{cases} \begin{cases} \# \\ C \end{cases} \begin{cases} (a) \\ (b) \\ (c) \end{cases}$$

Environment (a) of rule (VI) has to be restricted to stems so that we do not generate * $\text{[xdm}\partial\text{t]}$ after Syncope has applied. Syncope will have to be ordered before Epenthesis in order to create the appropriate environment in forms such as $\text{[x}\partial\text{m}\partial\text{t]}$ (from /xdm+it/)⁶. Syncope will be formulated in the same way as earlier.

This present analysis will, therefore, save us the cost of the Metathesis rule that was posited in the earlier analysis. At this point we have a Syncope rule and a revised Epenthesis rule ordered in this order, instead of the four rules formulated earlier. The evaluation metric would clearly favor the present analysis over the former. Let us see, now, how this analysis accounts for the data:

xdm+it	xdm	xdm+at	n+xdm	t+xdm+u	UNDERLYING REPRESENTATION
xdm+t	---	-----	-----	-----	SYNCOPE
-----	x d m	-----	n+x d m	-----	EPENTHESIS (a)
x d m+t	----	-----	-----	-----	EPENTHESIS (b)
-----	----	x d m+at	n+x d m	t+x d m+u	EPENTHESIS (c)
x d m+t	x d m	x d mat	n+x d m	tx d mu	DERIVED FORMS

Now that the superiority of the later analysis has been

proved, the earlier one will not be given any further attention.

Consider now the Active Participles of the verb under consideration:

xadəm	masculine singular
xadma	feminine singular
xadmin	plural

We notice that the active participle has [a] in its stem, and this never occurs in the perfective or the imperfective. For the masculine singular, we see that [a] occurs in the environment:

C — C a C

If we postulate a rule to this effect depending merely on phonological environment, then the rule will apply also to the perfective and instead of [xadəm] we would end up with *[xadəm] . The formation of active participles is apparently sensitive to both the syntactic and the phonological environments of the verb stem. Assuming the feature [Participle] , and anticipating a later discussion of passive participles, I will posit the following rule for the active participles under consideration.

(VII) ACTIVE PARTICIPLE FORMATION

$$\emptyset \longrightarrow a / \#C \begin{bmatrix} + \text{Participle} \\ - \text{Passive} \end{bmatrix}$$

The suffixes /a/ (feminine singular) and /in/ (plural) are similar to the suffixes in the perfective forms given earlier,

and will not be given further attention. One question arising here is whether these forms undergo any other phonological rules. The intermediate form /xadm/ meets the structural description of the (a) subrule of Epenthesis, which will insert the schwa, giving [xadəm].

Consider, finally, the passive participles of the same verb:

məxdum	masculine singular
məxduma	feminine singular
məxdumin	plural

What has been said about active participles will apply, with additions, to passive participles. I assume an early rule, roughly as follows:

(VIII) PASSIVE PARTICIPLE FORMATION

$$\begin{array}{c} \boxed{\text{CCC}} \\ \text{stem} \end{array} \longrightarrow \text{m+ CCuC} / \begin{array}{|l} + \text{ participle} \\ + \text{ passive} \end{array}$$

The suffixes, clearly, are as in the active participles.

What other rules might apply? The form of the plural meets the structural description of Syncope, but if this rule applies, we will generate *[məxdumn]. This would be the form of the plural at the end of the derivation, that is after undergoing subsequent Epenthesis. How can we prevent Syncope from applying to the above item? Syncope must be restricted so that it applies to /xām+ina/, but not to /m+xdum+in/.

The rule could be revised as follows:

(IX) SYNCOPE

$$i \longrightarrow \emptyset / C + \text{---} C \begin{matrix} \langle V \rangle \\ \langle +nasal \rangle \end{matrix}$$

The addition to this rule is that /n/ has to be followed by a vowel in order for /i/ to be elided. The schwa insertion in the passive participles will be effected by subrule (c) of Epenthesis in a straightforward way.

B- DOUBLED TRICONSONANTAL STEMS⁷

Consider:

məddit	I handed over
mədditi	you handed over
mədd	he handed over
məddat	she handed over
məddina	we handed over
mədditu	you (plural) handed over
məddu	they handed over

To account for the above data we would have to revise both Syncope and Epenthesis. Syncope could have a restriction added to it as follows:

(X) SYNCOPE

$$i \longrightarrow \emptyset / CiCj + \text{---} C \begin{matrix} \langle V \rangle \\ \langle +nasal \rangle \end{matrix}$$

condition: $i \neq j$

This will prevent /i/ from being elided in this category of verbs. As for Epenthesis, the schwa will be inserted by Subrule (c) in all the items under discussion except the third person singular [mədd]. If we do not constrain the rule, subrule (a) would apply and we would generate *[mədəd].

We must prevent Epenthesis from breaking up geminates as follows:

(XI) EPENTHESIS

$$\emptyset \longrightarrow \emptyset / C_i \text{ --- } C_j \left[\begin{array}{l} \text{stem} \\ C \\ C \end{array} \left\{ \begin{array}{l} \#, i \neq j \\ C \\ V \\ \# \end{array} \right\} \right] \left\{ \begin{array}{l} (a) \\ (b) \\ (c) \\ (d) \end{array} \right\}$$

Now the third person singular will be generated by subrule (c). Here is a derivation of some of the items under discussion.

mādd+it	mādd	mādd+itu	mādd+u	UNDERLYING REPRESENTATION
-----	---	-----	-----	SYNCOPE
-----	---	-----	-----	EPENTHESIS (a)
-----	---	-----	-----	EPENTHESIS (b)
mādd+it	---	mādd+itu	mādd+u	EPENTHESIS (c)
-----	mādd	-----	-----	EPENTHESIS (d)
māddit	mādd	mādditu	māddu	DERIVED FORM

Consider, now, the imperfective of the same verb:

nmādd	I hand over
tmādd	you (masculine) hand over
tmāddi	you (feminine) hand over
ymādd	he hands over
tmādd	she hands over
nmāddu	we hand over
tmāddu	you (plural) hand over
ymāddu	they hand over

In these cases the schwa will be inserted by Epenthesis subrules (c) and (d) with no new changes in the rule.

Consider the participles of such verbs:

madd	masculine singular active
madda	feminine singular active
maddin	plural active
məmdud	masculine singular passive
məmduda	femine singular passive
məmdudin	plural passive

These forms are perfectly regular and will be given by the rules posited earlier for sound stem participles (pp. 10 and 11). The only other rule that will have to apply is Epenthesis (c) to insert the schwa after the first segment in the passive forms. Here is a derivation of some imperfective and participle forms:

t+mdd+i	mdd+in [+ participle - passive]	mdd+a [+ participle - passive]	UNDERLYING REPRESENTATION
-----	madd+in	-----	ACTIVE PARTICIPLE FORMATION
-----	-----	m+mdud+a	PASSIVE PARTICIPLE FORMATION
-----	-----	-----	SYNCOPE
-----	-----	-----	EPENTHESIS (a)
-----	-----	-----	EPENTHESIS (b)
t+mədd+i	-----	mə+mdud+a	EPENTHESIS (c)
-----	-----	-----	EPENTHESIS (d)
tməddi	maddin	məmduda	DERIVED FORM

Here is a summary of the rules posited so far.

(XII) ACTIVE PARTICIPLE FORMATION

$$\emptyset \longrightarrow a / \#C \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \end{array} \right]$$

(2) PASSIVE PARTICIPLE FORMATION

$$\begin{array}{c} \text{[CCC]} \\ \text{stem} \end{array} \longrightarrow \text{m+ CCuC} / \left[\begin{array}{c} + \text{ participle} \\ - \text{ passive} \end{array} \right]$$

(3) SYNCOPE

$$i \longrightarrow \emptyset / CiCj + \text{---} \begin{array}{c} c \langle v \rangle \\ \langle \text{nasal} \rangle \end{array}$$

condition $i \neq j$

(4) EPENTHESIS

$$\emptyset \longrightarrow \emptyset / Ci \text{---} Cj \left\{ \begin{array}{c} \text{stem} \\ \left[\begin{array}{c} \{ \# , i \neq j \} \\ \{ C \\ \{ V \} \\ \{ \# \} \end{array} \right] \end{array} \right\} \left\{ \begin{array}{c} (a) \\ (b) \\ (c) \\ (d) \end{array} \right\}$$

These rules will account for all the verbs which have an underlying triconsonantal stem. It should be pointed out, however, that there is cause for some concern. Why is it that both Syncope and Epenthesis (a) have identical restrictions on the CC clusters? This duplication looks suspicious even if not formally counted by the evaluation metric. Note also the duplication (this time counted) within Epenthesis itself: (a) and (d) are similar, though apparently uncollapsible; and the C outside the stem bracket in (b) is, in some uncaptured sense, the same C as that before $\left\{ \begin{array}{c} V \\ \# \end{array} \right\}$ in (c) and (d).

SECTION II

VERBS WITH UNDERLYING QUADRICONSONANTAL STEMS⁸

Consider the following verb forms and their underlying representations:

dərdərt	/ərdər + it/	I sprinkled
dərdərna	/ərdər + ina/	we sprinkled
tərdəər	/t + ərdər/	you sprinkle
yərdəər	/y + ərdər/	he sprinkles

The above items will be accounted for by the rules that have been posited so far. Both schwas in each item will be inserted by Epenthesis. Now, consider these other forms of the same verbs and their underlying representations.

dərdrat	/ərdər + at/	she sprinkled
dərdru	/ərdər + u/	they sprinkled
tərdəri	/t + ərdər + i/	you (feminine) sprinkle

If we apply Epenthesis, as it stands now, to the above forms we will generate the following ungrammatical forms:

*[drədrat_]
 *[drədru_]
 *[tədrədri_]

Therefore, Epenthesis will have to be revised so that we can accommodate these forms. The new form of the rule will look as follows:

(XIII) EPENTHESIS

$$\emptyset \longrightarrow \begin{matrix} \text{stem} \\ \text{stem} \end{matrix} \left[\begin{matrix} & C_i & \\ & & C_j \end{matrix} \right] \begin{matrix} \text{stem} \\ \text{stem} \end{matrix} \left\{ \begin{matrix} \{ \#, i \neq j \} \\ \{ C \} \\ \{ < C > \} \end{matrix} \right\} \left\{ \begin{matrix} \{ a \} \\ \{ b \} \\ \{ c \} \\ \{ d \} \end{matrix} \right\}$$

This rule will now accommodate such items as $\left[\text{td} \text{ə} \text{rd} \text{ri} \right]$. The left stem bracket has been added so that prefix consonants do not allow the rule to apply incorrectly. For instance, after subrule (a) has introduced the rightmost schwa in $\text{t} \text{ə} \text{drd} \text{ə} \text{r}$, the next subrule that would apply is the largest expansion of (c) and we would generate $* \left[\text{t} \text{ə} \text{drd} \text{ə} \text{r} \right]$ instead of $\left[\text{td} \text{ə} \text{rd} \text{ə} \text{r} \right]$. The stem bracket prevents that from happening, so that when angled bracket material is not considered, (c) will break up the CCC cluster in the stem.

Let us now turn to the participles of this category of verbs⁹. Consider the passive participles:

$\text{md} \text{ə} \text{rd} \text{ə} \text{r}$	masculine singular
$\text{md} \text{ə} \text{rd} \text{ə} \text{ra}$	feminine singular
$\text{md} \text{ə} \text{rd} \text{rin}$	plural

Our rule of Passive Participle Formation will not yield the above forms, since it only deals with triconsonantals. Let us revise it and generalize it to include this category of verbs:

(XIV) PASSIVE PARTICIPLE FORMATION

$$\left[\begin{array}{c} \text{ccc} \langle \text{c} \rangle \\ \text{stem} \end{array} \right] \longrightarrow \text{m} + \text{cc} \left\{ \begin{array}{c} \langle \emptyset \rangle \\ \text{u} \end{array} \right\} \text{c} \langle \text{c} \rangle / \left[\begin{array}{c} + \text{participle} \\ - \text{passive} \end{array} \right]$$

The use of the angled bracketing in this rule guarantees that when we have a passive participle, quadriconsonantal stems will not have the vowel $\left[\text{u} \right]$ and triconsonantal stems will. After this rule applies, Epenthesis will insert the

schwas in the correct environments. Now, here is a derivation of some of the quadriconsonantal forms:

drdr+ina	drdr+at	t+drdr+i	drdr [+ participle - passive]	UNDERLYING REPRESENTA- TION
-----	-----	-----	----	ACTIVE PARTICIPLE FORMATION
-----	-----	-----	m+drdr	PASSIVE PARTICIPLE FORMATION
drdr+na	-----	-----	----	SYNCOPE
-----	-----	-----	m+drdər	EPENTHESIS (a)
drdər+na	-----	-----	----	EPENTHESIS (b)
-----	dərdr+at	t+dərdr+i	----	EPENTHESIS (c)1
dərdər+na	-----	-----	m+dərdər	EPENTHESIS (c)2
-----	-----	-----	----	EPENTHESIS (d)
dərdərna	dərdrat	tdərdri	mdərdər	DERIVED FORM

Here is a summary of the rules, as they stand at this point:

(1) ACTIVE PARTICIPLE FORMATION

$$\emptyset \longrightarrow a / \# C \begin{bmatrix} + \text{ participle} \\ - \text{ passive} \end{bmatrix}$$

(2) PASSIVE PARTICIPLE FORMATION

$$\begin{bmatrix} CCC <C> \\ \text{stem} \end{bmatrix} \longrightarrow m+CC \begin{bmatrix} \{\emptyset\} \\ \{u\} \end{bmatrix} C <C> / \begin{bmatrix} + \text{ participle} \\ - \text{ passive} \end{bmatrix}$$

(3) SYNCOPE

$$i \longrightarrow \emptyset / CiCj + \text{---} C \langle V \rangle$$

$\langle +\text{nasal} \rangle$

condition $i \neq j$

(4) EPENTHESIS

$$\emptyset \longrightarrow \emptyset / \underset{\text{stem}}{<[>} Ci \text{---} Cj \left\{ \begin{array}{l}] \\ \text{stem} \\ <C> \end{array} \right. \left\{ \begin{array}{l} \#, i \neq j \\ C \\ \{V\} \\ \{ \# \} \end{array} \right\} \left\{ \begin{array}{l} (a) \\ (b) \\ (c) \\ (d) \end{array} \right\}$$

SECTION III: VERBS WITH AN UNDERLYING MEDIAL VOWEL¹⁰

Consider:

A

fəqt
fəqti
fəq
fəqət
fəqna
fəqtu
fəqu

I woke up
you woke up
he woke up
she woke up
we woke up
you (pl.) woke
up
they woke up

xəft
xəfti
xəf
xəfət
xəfna
xəftu
xəfu

I got scared
you got scared
he got scared
she got scared
we got scared
you (pl.) got
scared
they got scared

B

nfiq
tfiq
tfiqi
yfiq
tfiq
nfiq
tfiq
yfiq

we wake up
you (masc.) wake
up
you (fem.) wake
up
he wakes up
she wakes up
we wake up
you (pl.) wake
up
they wake up

nxaf
txaf
txafi
yxaf
txaf
nxafu
txafu
yxfu

I get scared
you (masc.)
get scared
you (fem.) get
scared
he gets scared
she gets scared
we get scared
you (pl.) get
scared
they get scared

wake up: (masc.)
wake up: (fem.)
wake up: (pl.)

xaf
xaf
xafu

get scared!
(masc.)
get scared (fem.)
get scared: (pl.)

C

səgt
səgti
səg
səgət
səgna
səgtu
səgu

I drove
you drove
he drove
she drove
we drove
you (pl.)
drove
they drove

nsug
tşug
tşugi
yşug
tşug
nşugu
tşugu
yşugu

I drive
you (masc.)
drive
you (fem.)
drive
he drives
she drives
we drive
you (pl.)
drive
they drive

sug
sugi
şugu

drive!
(masc.)
drive: (fem.)
drive: (pl.)

For the preceding data, I am going to postulate that the stems are of the form CVC. The underlying consonants stay the same; there are no alternations. The complexity lies in defining what the underlying vowels are. I will propose that the underlying stem vowel for the set of data under A is /i/, that of B is /a/, and that of C is /u/. The reasoning behind this is that in the imperfective and the imperative the stem vowel for A always emerges as [i], that of B as [a], and that of C as [u]. Now, how do we account for the alternations in the perfective?

At first view, the occurrence of [ə] in the various forms seems to result from the stem vowels being reduced when followed by two consonants. One could posit a rule that would state that in this category of verbs, when a vowel is followed by two consonants, it gets reduced. This would work out correctly only if we extend Syncope to these forms so that we have the two consonants following the vowel to be reduced. A closer look at the data shows that the schwa is in the same environment where subrule (b) of Epenthesis would insert it. So a better way to account for the data is by an ad hoc deletion of the medial vowel prior to Epenthesis. This will not only allow Epenthesis to apply but it will also feed into Syncope. As we will see in a later section, the rule that deletes the vowel here should be specified in such

a way that it will only apply to this category of verbs. This category of verbs will, arbitrarily, be called Vb_3 verbs and the rule will be stated as follows:

(XV) VOWEL DELETION

$$V \longrightarrow \emptyset / \left[\begin{array}{l} + \text{ perfective} \\ - Vb_3 \end{array} \right]$$

This rule has been restricted to the perfective, because it should not apply to the imperfective and imperative. It will have to be ordered before Syncope, so that the suffix /i/ gets deleted, setting up the environment for Epenthesis.

Let us now consider the third person forms, namely:

faq	xaf	saq
fa a t	xa a t	sa a t
faqu	xafu	saqu

We see that these forms, consistently, have a medial $\left[a \right]$ no matter what the underlying stem vowel is. It could be suggested that a readjustment rule states that the medial vowel of Vb_3 verbs becomes $\left[a \right]$ in the third person forms of the perfective. One could also posit that $\left[a \right]$ is inserted by a phonological rule. Since there seems to be no clear way of deciding which is better, I opt for the latter choice. The rule will be of the form:

(XVI) THIRD PERSON FORMATION

$$V \longrightarrow a / \left[\begin{array}{l} + \text{ perfective} \\ + \text{ 3d person} \\ + Vb_3 \end{array} \right]$$

This rule will have to be ordered before vowel deletion

which must be prevented from deleting the vowel in these forms. I will specify that VOWEL DELETION applies to forms other than third person.

(XVII) VOWEL DELETION

$$V \longrightarrow \emptyset / \left[\begin{array}{l} + \text{ perfective} \\ - \text{ 3d person} \\ + Vb_3 \end{array} \right]$$

But notice that (XVI) and (XVII) are collapsible as follows:

(XVIII) PERFECT READJUSTMENT

$$V \longrightarrow \left\{ \begin{array}{l} \langle a \rangle \\ \emptyset \end{array} \right\} \left[\begin{array}{l} + \text{ perfective} \\ \langle + \text{ 3d person} \rangle \\ + Vb_3 \end{array} \right] \quad \begin{array}{l} (a) \\ (b) \end{array}$$

Now consider:

fag~~a~~t
xaf~~a~~t
sag~~a~~t

It was posited earlier in the sections dealing with triconsonantal and quadriconsonantal stems that the underlying suffix for the third person singular feminine is /-at/. In the above items it shows up as $\left[-\text{a}t \right]$, but since this is not an environment where we would expect an insertion of $\left[\text{a} \right]$ by Epenthesis, I will assume that the suffix /a/ has been reduced.¹¹ I will posit a vowel reduction rule to account for the third person singular feminine of these verbs.

(XIX) SUFFIX VOWEL REDUCTION

$$a \longrightarrow \emptyset / VC + \text{---} C\#$$

where V is a full vowel.

This rule will have to be ordered after Perfect Readjustment.

Here is a representative derivation of the stems discussed above:

fiq+it	xaf+ina	ṣug+itu	ṣug	fiq+at	UNDERLYING REPRESENTATION
-----	-----	-----	ṣag	faq+at	PERFECT READJUSTMENT (a)
fq+it	xf+ina	ṣg+itu	---	-----	PERFECT READJUSTMENT (b)
-----	-----	-----	---	faq+ t	SUFFIX VOWEL REDUCTION
fq+t	xf+na	ṣg+tu	---	-----	SYNCOPE
faq+t	xaf+na	ṣag+tu	---	-----	EPENTHESIS (b)
fəqt	xəfna	ṣəgtu	ṣag	faqət	DERIVED FORM

Let us now turn to the participles of these verbs.

Active Participles

fayəq	xayəf	sayəg	masculine singular
fayqa	xayfa	ṣayga	feminine singular
faygin	xayfin	ṣaygin	plural

We see that the verbs with /fiq/ as underlying stems follow a very similar pattern of the triconsonantals, i.e. [a] is inserted after the first segment from the left. But the underlying /i/ becomes the corresponding glide [y]. A rule could be formulated to this effect:

(XX) VOWEL GLIDE ALTERNATION

i → y / a —

Since the other verbs follow the same pattern as /fiq/, I will assume that in the active participle their underlying

vowel undergoes an ad hoc change to /i/ before the above rule applies. This change will be accounted for by the following rule:

$$(XXI) \text{ VOWEL CHANGE}$$

$$V \longrightarrow i \quad / \quad \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \\ + Vb_3 \end{array} \right]$$

This rule has been restricted to Vb_3 in anticipation of its non-application to the verbs discussed in the following section. It will have to be ordered before Perfect Readjustment, Active Participle Formation and Vowel Glide Alteration. Here is a derivation of the active participles of these verbs:

fiq	xaf+a	ṣug+in	UNDERLYING REPRESENTATION
---	xif+a	ṣig+in	VOWEL CHANGE
faiq	xaif+a	ṣaig+in	ACTIVE PARTICIPLE FORMATION
fayq	xayf+a	ṣayg+in	VOWEL GLIDE ALTERATION
fayṣq	-----	-----	EPENTHESIS (a)
fayṣq	xayfa	ṣaygin	DERIVED FORM

Consider the passive participles of these verbs:

mfiyyṣq	mxuwwṣf	mṣuwwṣg	masculine singular
mfiyyqṣ	mxuwwfa	mṣuwwga	feminine singular
mfiyyṣin	mxuwwfin	mṣuwwgin	plural

One could, at this point, formulate another Passive Participle Formation rule for this category of verbs. It could be stated as:

$$(XXII) \text{ PASSIVE PARTICIPLE FORMATION II}$$

$$Vb_3 \longrightarrow m \quad \left[\begin{array}{l} \text{CVGGC} \\ \text{stem} \end{array} \right] \quad / \quad \left[\begin{array}{l} + \text{ participle} \\ + \text{ passive} \end{array} \right]$$

where the initial CV and final C would be the same as the underlying initial CV and final C of the stem. Then we could have a rule that would determine what the glides are going to be. The rule would be of the following form:

(XXIII) BACKNESS ASSIMILATION

$$G \longrightarrow \begin{bmatrix} \alpha & \text{back} \end{bmatrix} / V \begin{bmatrix} \alpha & \text{back} \end{bmatrix}$$

This rule would allow us to put the correct glides in the correct environment. In other words, we would choose $\begin{bmatrix} + & \text{back} \end{bmatrix}$ glides when they are preceded by a $\begin{bmatrix} + & \text{back} \end{bmatrix}$ vowel, and $\begin{bmatrix} - & \text{back} \end{bmatrix}$ glides when they are preceded by a $\begin{bmatrix} - & \text{back} \end{bmatrix}$ vowel.

To generate the correct passive participles for this category of verbs, we would still need an additional rule to determine what the stem vowel is going to be, since there is an alternation between $\begin{bmatrix} i \end{bmatrix}$ and $\begin{bmatrix} u \end{bmatrix}$ in the above forms. Notice that we get a $\begin{bmatrix} - & \text{round} \\ + & \text{high} \end{bmatrix}$ vowel before a $\begin{bmatrix} - & \text{round} \end{bmatrix}$ glide. The rule could be stated as follows:

(XXIV) VOWEL - GLIDE ASSIMILATION

$$V \longrightarrow \begin{bmatrix} \alpha & \text{round} \\ + & \text{high} \end{bmatrix} / \text{---} \begin{bmatrix} \alpha & \text{round} \end{bmatrix}^G$$

Here is a representative derivation of the passive participles under discussion:

fiq	xaf	sug	UNDERLYING REPRESENTATION
mfiGGqa	mxaGGfin	msuGGgin	PASSIVE PARTICIPLE FORMATION II
mfiyyga	mxawwfin	msuwwgin	BACKNESS ASSIMILATION
-----	mxuwwfin	-----	VOWEL GLIDE ASSIMILATION

mfiyyqa mxuwvfin msuwvgin DERIVED FORMS

Now, these rules seem to work correctly. Anticipating the data to be analyzed in the following section, we will have to restrict these rules to the passive participle of Vb₃ verbs because they will conflict with some items to be considered next. I will leave this problem unresolved at this point. Because further investigation into the generality of these rules has proved vain and unproductive, I will not include them in the following summary. Therefore, accounting for these passive participles in a more adequate manner will remain a residual problem.

Here is now a summary of the rules:

(1) VOWEL CHANGE

$$V \longrightarrow i \quad / \quad \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \\ + \text{ Vb}_3 \end{array} \right]$$

(2) ACTIVE PARTICIPLE FORMATION

$$\emptyset \longrightarrow a \quad / \quad \#C \quad \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \end{array} \right]$$

(3) VOWEL GLIDE ALTERNATION

$$i \longrightarrow y \quad / \quad a \text{ — }$$

(4) PERFECT READJUSTMENT

$$V \longrightarrow \left\{ \begin{array}{l} \langle a \rangle \\ \emptyset \end{array} \right\} / \quad \left[\begin{array}{l} + \text{ perfective} \\ \langle + \text{ 3d person} \rangle \end{array} \right]$$

(5) SUFFIX VOWEL REDUCTION

$$a \longrightarrow \partial \quad / \quad VC + \text{ — } C\#$$

where V is a full vowel

(6) PASSIVE PARTICIPLE FORMATION

$$\left[\begin{array}{c} \text{CCC} \langle C \rangle \\ \text{stem} \end{array} \right] \longrightarrow C \text{ m+ } CC \left\{ \begin{array}{c} \langle \emptyset \rangle \\ u \end{array} \right\} C \langle C \rangle / \left[\begin{array}{c} + \text{ participle} \\ + \text{ passive} \end{array} \right]$$

(7) SYNCOPE

$$i \longrightarrow \emptyset / CiCj + \text{---} C \langle V \rangle$$

condition $i \neq j$ $\langle +\text{nasal} \rangle$

(8) EPENTHESIS

$$\emptyset \longrightarrow \partial / \left[\begin{array}{c} \langle \rangle \\ \text{stem} \end{array} \right] Ci \text{---} Cj \left\{ \begin{array}{c} \left[\begin{array}{c} \text{stem} \\ \langle C \rangle C \end{array} \right] \left\{ \begin{array}{c} \# \\ C \\ V \\ \# \end{array} \right\} \\ \# , i \neq j \end{array} \right\} \left\{ \begin{array}{l} (a) \\ (b) \\ (c) \\ (d) \end{array} \right\} \begin{array}{l} 1 \\ 2 \\ 1 \\ 2 \end{array}$$

SECTION IV. VERBS WITH AN UNDERLYING FINAL VOWEL¹²

Consider the following:

PERFECTIVE:

kmit	I smoked	bɔit	I began
kmiti	you smoked	bɔiti	you began
kma	he smoked	bɔa	he began
kmat	she smoked	bɔat	she began
kmina	we smoked	bɔina	we began
kmitu	you smoked	bɔitu	you began
kmaɔ	they smoked	bɔaɔ	they began

IMPERFECTIVE:

nəkmi	I smoke	nəbɔa	we begin
təkmi	you smoke	təbɔa	you begin
təkmi	you (fem.) smoke	təbɔay	you (fem.) begin
yəkmi	he smokes	yəbɔa	he begins
təkmi	she smokes	təbɔa	she begins
nəkmiw	we smoke	nəbɔaɔ	we begin
təkmiw	you smoke	təbɔaɔ	you begin
yəkmiw	they smoke	yəbɔaɔ	you begin

IMPERATIVE:

kmi	smoke! (masc.)	bɔa	begin! (masc.)
kmi	smoke! (fem.)	bɔay	begin! (fem.)
kmiw	smoke! (plural)	bɔaɔ	begin! (plural)

ACTIVE PARTICIPLES:

kami	badi
kamya	badya
kamyin	badyin

PASSIVE PARTICIPLES:

məkmi	məbɔi
məkmiya	məbɔiya
məkmiyin	məbɔiyin

I am going to propose that these verbs are of the form CCV. The underlying consonants are obvious since the consonants that emerge in the derived forms are the same all

the time. The choice of the underlying vowel will again be based on the frequency of occurrence. The underlying representation for the verb meaning "to smoke" is then /kmi/ and that of the verb meaning "to begin" will be /bda/. Looking at the third persons of the perfective, we see again that they all have [a] in them. So, the earlier rule which places [a] in the third persons of the verbs accounted for in Section III will apply here too. But on the other hand, we do not want it to delete the stem vowel in the non-third person forms. If it did, when these forms reached Syncope, they would meet its structural description and it would delete the /i/, setting them up for Epenthesis so that we would end up with ungrammatical forms such as * $\left[\text{k}\text{a}\text{m}\text{t} \right]$ for $\left[\text{k}\text{m}\text{i}\text{t} \right]$. To avoid this Perfect Readjustment will be revised as follows:

(XXV) PERFECT READJUSTMENT

$$v \longrightarrow \left\{ \begin{array}{c} \langle \emptyset \rangle \\ a \end{array} \right\} / \left[\begin{array}{c} + \text{ perfective} \\ \langle -3\text{d person} \rangle \\ \text{stem} \end{array} \right] \langle c \rangle \quad \begin{array}{l} (a) \\ (b) \end{array}$$

This rule will apply to Vb_3 verbs to delete the vowel of the non-third person forms and change the stem vowel of the third person forms into an [a]. It will apply to the verbs in this section, to change the stem vowel of all the forms to an [a]. This will prevent Syncope from applying to these verbs. Notice also that we do not need to specify this rule to any category of verbs. It will apply to the

appropriate forms only, given just the phonological environment. Now we need a rule to delete the \bar{a} of the non-third person forms of the verbs under discussion.

(XXV) STEM VOWEL DELETION

$$a \longrightarrow \emptyset \quad / \quad \text{---} + VC$$

This rule will have to be ordered after Perfect Readjustment and after Syncope. We still need a rule that accounts for the change of /u/ into \bar{w} in the third person plural of the perfective. It will be stated as:

(XXVI) VOWEL-GLIDE ALTERNATION

$$u \longrightarrow w \quad / \quad a \text{ ---}$$

We need a closely similar rule to account for the endings of the plural forms of the imperfective and the imperative. This rule will change /u/ into \bar{w} either after /a/ or after /i/. Instead of writing separate rules for these, I am going to extend the environment of rule XXVI to all vowels. Therefore, Vowel-Glide Alternation will be revised to become

(XXVII) VOWEL-GLIDE ALTERNATION

$$u \longrightarrow w \quad / \quad V \text{ ---}$$

This rule will account for all the forms ending in a glide discussed so far.

Notice that a similar change of vowel into a glide occurs in the second person feminine of the imperfective as well as the feminine form of the imperative of the verb meaning "to begin". The change in this case, though, is

from /i/ into $\left[\text{y} \right]$, similar to the one encountered in the active participles in section III. Comparing this alternation with the one stated in rule XXVII, we see that a $\left[+ \text{ back} \right]$ vowel changes into a $\left[+ \text{ back} \right]$ glide, whereas a $\left[- \text{ back} \right]$ vowel changes into a $\left[- \text{ back} \right]$ glide. This calls for a generalization that will account for all these alternations, and rule XXVI will be extended and generalized as follows:

(XXVIII) VOWEL-GLIDE ALTERNATION

$$\begin{array}{ccc} V_i & \text{---} & G \\ \left[\alpha \text{ back} \right] & \left[\alpha \text{ back} \right] & / \end{array} \quad \begin{array}{ccc} & & V_j \text{---} \\ & & \end{array}$$

where $V_i \neq V_j$

This rule will account for all the items ending in a glide discussed so far. It had to be restricted to different vowels so that it does not apply to the feminine imperative form, for instance, which has an underlying representation /kmi + i/ and gets realized as $\left[\text{kmi} \right]$. Since this rule has been generalized to more data it will have to be ordered after Perfect Readjustment and some other rules posited below. Consider, now, the feminine forms of the second person singular imperfective and the second person singular imperative of /kmi/ their respective underlying representations are /t+kmi+i/ and /kmi+i/. A rule of Vowel Coalescence will account for them.

(XXIX) VOWEL COALESCENCE

$$V_i V_i \longrightarrow V_i$$

condition $i=i$

The ordering of this rule with the rest of the rules is not crucial. I will arbitrarily order it after Stem Vowel Deletion. Here is a derivation of some of the forms discussed so far in this section.

kmi+iti	kmi	bda+ina	t+bda+i	t+kmi+i	
-----	---	-----	-----	-----	PERFECT READJUSTMENT (a)
kma+iti	kma	-----	-----	-----	PERFECT READJUSTMENT (b)
km+iti	---	bd+ina	-----	-----	STEM VOWEL DELETION
-----	---	-----	-----	t+kmi	VOWEL COALESCENCE
-----	---	-----	t+bda+y	-----	VOWEL GLIDE ALTERNATION
-----	---	-----	tə+bda+y	tə+kmi	EPENTHESIS (c)2
kmiti	kma	bdina	təbday	təkmi	DERIVED FORMS

The participles will not be discussed since their investigation has proved fruitless. I will leave them unaccounted for at this time. Here is a final summary of rules in their order of application:

(1) VOWEL CHANGE

$$V \longrightarrow i \quad \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \\ + Vb_3 \end{array} \right]$$

(2) ACTIVE PARTICIPLE FORMATION

$$\emptyset \longrightarrow a \quad / \quad \#C \quad \left[\begin{array}{l} + \text{ participle} \\ - \text{ passive} \end{array} \right]$$

(3) PERFECT READJUSTMENT

$$V \longrightarrow \left\{ \begin{array}{c} \emptyset \\ a \end{array} \right\} / \left[\begin{array}{c} + \text{perfective} \\ \text{3d person} \end{array} \right] \langle C \rangle \quad \begin{array}{l} (a) \\ (b) \end{array}$$

(4) SUFFIX VOWEL REDUCTION

$$a \longrightarrow \partial / VC + \text{---} C\#$$

where V is a full vowel

(5) PASSIVE PARTICIPLE FORMATION

$$\left[\begin{array}{c} CCC \langle C \rangle \\ \text{stem} \end{array} \right] \longrightarrow m + CC \left\{ \begin{array}{c} \emptyset \\ u \end{array} \right\} C \langle C \rangle / \left[\begin{array}{c} + \text{participle} \\ + \text{passive} \end{array} \right]$$

(6) SYNCOPE

$$i \longrightarrow \emptyset / C_i C_j + \text{---} \left\{ \begin{array}{c} C \\ \text{nasal} \end{array} \right\} \langle V \rangle$$

condition: $i \neq j$

(7) STEM VOWEL DELETION

$$a \longrightarrow \emptyset / \text{---} + VC$$

(8) VOWEL COALESCENCE

$$V_i V_i \longrightarrow V_i$$

where $i=i$

(9) VOWEL-GLIDE ALTERNATION

$$\left[\begin{array}{c} V_i \\ \text{back} \end{array} \right] \xrightarrow{\quad} G \left[\begin{array}{c} \text{back} \end{array} \right] / V_j \text{---}$$

(10) EPENTHESIS

$$\emptyset \longrightarrow \emptyset / \left[\begin{array}{c} \text{---} \\ \text{stem} \end{array} \right] C_i \text{---} C_j \left\{ \begin{array}{c} \left[\begin{array}{c} \text{---} \\ \text{stem} \end{array} \right] \left\{ \begin{array}{c} \# \\ C \\ \langle C \rangle \end{array} \right\} \\ \left\{ \begin{array}{c} \# \\ C \\ V \\ \# \end{array} \right\} \end{array} \right\} \left\{ \begin{array}{l} (a) \\ (b) \\ (c) \\ (d) \end{array} \right\} \begin{array}{l} 1 \\ 2 \\ 1 \\ 2 \end{array}$$

CONCLUSION

In this work I have tried to account for some aspects of the phonology of the Moroccan Arabic verb. The data that I have discussed is representative of the great majority of verbs in Moroccan Arabic. This is not based on statistical facts but on the basis of casual observation of the verbs that occur in normal daily conversation. The data has been arrived at, mainly, through introspection.

The rules that have been posited account for most of the data that has been discussed. Some problems seem to remain unresolved, though. For example, one notices in the Epenthesis rule, the duplication in the environments (b) and (c). One can also find a duplication of the restriction on Syncope and environment (a) of Epenthesis. Finally, certain participles seem to require a number of ad hoc adjustments or restrictions leading to greater complexity and some rules that apply to only a handful of forms. Such apparent idiosyncratic behavior makes it impossible to formulate interesting linguistic generalizations. Therefore, some of those participles have been left unaccounted for after long and vain investigation. This might lead one to assume that Moroccan Arabic is going through change. The assumption seems to be valid and a diachronic study might be in order.

In this thesis, I have given a brief historical account

of the background of Moroccan Arabic. I have accounted for the majority, almost the totality, of the verbs of Moroccan Arabic with a minimum number of rules. Ideally, this thesis would have included other aspects of the phonology of Moroccan Arabic, but given the time factor and the total lack, to my knowledge, of other generative work on Moroccan Arabic, this thesis had to be restricted to its present form. I hope this work will be a step ahead towards a more comprehensive and hence more serious account of the language.

FOOTNOTES

1. This problem of non-intelligibility of dialects has been raised by Michael Brame in a footnote to his article "On Stress Assignment in Two Arabic Dialects". He also raises the question of whether Palestinian and Maltese can still be called dialects of Arabic. I hold comparable reservations with respect to Moroccan Arabic.
2. The verb considered in this section is representative of all the verbs which have an underlying stem consisting of three different consonants. This is the only productive verb in Moroccan. Here is a partial list of verbs behaving like /xǝm/: /ktb/ 'write', /rɛt/ 'tie', /ʕrb/ 'drink', /nɛs/ 'sleep', /xrɛ/ 'go out', /ʕbr/ 'disappear', /blɛ/ 'swallow', /ʕlh/ 'repair', /dbh/ 'slaughter', /ʕlq/ 'boil'.
3. This and subsequent rules should of course be stated more formally -- that is in distinctive features. For ease of presentation, I will continue to formulate rules rather informally.
4. This rule has been formulated as a Transformational rule following Chomsky and Halle (1968). See particularly p. 360 and following.
5. Henceforth, I will refer to the analysis that has been exposed so far as the "earlier analysis", the parallel analysis that will be expounded will be referred to as the "later

analysis".

6. It might appear, at this point, that an analysis without Syncope, hence no underlying /i/ in the suffixes, is preferable. The motivation for Syncope will be clearer later in this work.

7. The verb discussed in this section is representative of all the verbs which have an underlying stem consisting of three consonants, the last two being geminates. Here is a partial list of verbs behaving like /mdd/: /^vsmm/ 'smell', /h_{tt}/ 'put', /h_{ll}/ 'open', /h_{kk}/ 'scratch', /r_{dd}/ 'return', /^vs_{dd}/ 'close', /m_{ll}/ 'get tired of', /f_{kk}/ 'untie', /l_{ff}/ 'wrap', /^vs_{qq}/ 'split'.

8. The verb discussed in this section is representative of verbs such as: /frg^ʃ/ 'blow', /bsbs/ 'to make the sound "bss"', /s_rs_r/ 'scream', /b_{ll}d/ 'civilize', /b_{ss}l/ 'to misbehave', /b^ʃ_ʃd/ 'to go in a roundabout way', /skkn/ 'to accommodate', /h_{dd}n/ 'to calm', /mrmd/ 'dirty something'.

9. This category of verbs has only passive participles. A semantic or syntactic study might be enlightening as to the reasons for this gap. Since this is not the point of this work, I will leave it unaccounted for.

10. The verbs discussed in this section are representative of such verbs as: /sal/ 'ask', /bat/ 'spend the night', /nal/ 'win': /^vsuf/ 'look', /dug/ 'taste', /s_{um}/ 'fast': /^vig/

'realize'; /ṭih/ 'fall', /ṣib/ 'bring'.

11. This calls for a general observation about Moroccan Arabic. From the vowel reduction in [faqəṭ], from what has been considered earlier in this work and from observation of much more data from Moroccan Arabic, it can be concluded that this language does not allow too many full vowels in a single word. This is why, when analyzing Moroccan Arabic speech, one encounters so many schwas. These are either inserted or are the result of reducing full vowels. This will, hopefully, be explored in more depth in subsequent research.

12. The verbs discussed in this section are representative of such verbs as: /ṣli/ 'mislay', /ksi/ 'clothe', /nfi/ 'exile', /bki/ 'cry', /hni / 'bend', /rda/ 'approve', /bra/ 'recover from an illness', /bta/ 'be late', /rša/ 'bribe', /sha/ 'forget'.

BIBLIOGRAPHY

- Brame, M. 1973. On stress assignment in two Arabic dialects. A Festschrift for Morris Halle, ed. by S. Anderson & P. Kiparsky, 14-25. New York: Holt, Rinehart, Winston.
- Chomsky, N., & M. Halle, 1968. The sound pattern of English. New York : Harper & Ross.
- Cohen, M.I. & L. Hahn, 1966. Morocco: Old land, new nation. New York : Frederick A. Praeger, Publishers.
- Harrell, R.S., 1962. A short reference grammar of Moroccan Arabic. Washington, D.C.: Georgetown University Press.
- Schane, S.A. 1973. Generative phonology. Englewood Cliffs, N.J.: Prentice Hall.

A GENERATIVE PHONOLOGY OF THE
MOROCCAN ARABIC VERB

by

ABDERRAFI BENHALLAM

B.A., Universite Mohammed V, Rabat, Morocco

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF ARTS

Department of Speech

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1976

ABSTRACT

This work attempts to account for the different forms of the Moroccan Arabic verb from a transformational-generative point of view. I have tried to determine what the underlying representations for these verbs and their affixes are and what sorts of rules apply to them.

I discuss four categories of verbs. They represent the quasi-totality of Moroccan Arabic verbs. The first two categories are verbs that have triconsonantal and quadriconsonantal underlying stems. The rules that generate the finite forms of these verbs are a rule of Epenthesis and a rule of Syncope.

The other two categories of verbs that are discussed are triliteral verbs; one of them has a medial vowel and is of the form CVC, and the other has a final vowel and is of the form CCV. Rules of Perfect Readjustment, Stem Vowel Deletion and Vowel-Glide Alternation have been posited to account for the various forms of these verbs. Some of the forms have shown too many idiosyncracies, and investigation had to be stopped at a time when it seemed to be unproductive.

An introductory section gives a brief historical sketch with the factors that might have helped form what is now Moroccan Arabic. The conclusion points out some of the problems in this work.