

An article that concerns more than one language is cited under each language with which the article deals.

AFROASIATIC:	Dombrowski-Dombrowski, Titov. SEE also Cohen
HAMITO-SEMITIC:	See AFROASIATIC
AKKADIAN:	Diakonoff, Edzard, D., Izre'el, Malbran-Labat, Meltzer, T., Von Soden. SEE also Dolgopolsky, Huchnergard, Puhvel
AMORITE:	Knudsen
ARABIC:	Abu-Haidar, Agius, Carter, Caubet, Comrie, Corriente, Diem, Fischer, Heath, Holes, Ingham, Jastrow, Krotkoff, Lentin, Levin, Miller, Owens, Piamenta, Shvitiel, Stroomer, Taine-Cheikh, Vanhove, Woidich. SEE also Amsalu, Bar-Asher, Kaye, Lowenstamm, Malkiel, Rendsburg, Rosenhouse, Troupeau; and Judeo-Arabic
ARAMAIC:	Greenfield, Morag, Pennacchietti, Tsereteli. SEE also Bloch, Macuch, Sabar, Spitaler, Troupeau
EBLAITE:	Fronzaroli, Gordon
ETHIOPIC:	Abraham Demoz, Ambros, Amsalu Aklilu, Correll, Daniels, Devens, Drewes, Fusella, Garad-Wagner, Getatchew Haile, Goldenberg, Hudson, Kane, Kapeliuk, Kaufman, Malone, Podolsky, Poláček, Prunet, Raz, Ricci, Richter, Rundgren, Uhlig, Yonas Admassu. SEE also Dietrich-Loretz, Gragg, Kaye, Lowenstamm, Macuch
HEBREW:	Bar-Adon, Barr, Bloch, Bolozky, Corré, Fishman, Frajzyngier-Katriel, Garbini, Hodge, Hoftijzer, Kaddari, Khan, Loprieno, Masson, Müller, O'Connor, Ornan, Revell, Schwarzwald, Yannai. SEE also Bar-Asher, Macuch, Rendsburg, Rosenhouse, Sabar, Segert, Spitaler, Zevit
JUDEO-ARABIC:	Blau, Bar-Asher, Hary
PHOENICIAN:	Israel. SEE also Zevit
SEMITIC:	Dolgopolsky, Edzard, L., Faber, Goshen-Gottstein, Greenberg, Lipiński, Marrassini, Murtonen, Rodgers, Rosén, Schramm, Steiner, Zaborski. SEE also Avanzini, Hudson, Heuhnergard, Kaye, Lowenstamm, Meltzer, E., Rendsburg, Segert
SOUTH ARABIAN:	Ryckmans, Simeone-Senelle and Lonnet, Swiggers. SEE also Avanzini, Hayes
SYRIAC:	See ARAMAIC
UGARITIC:	Arbeitman, Pardee, Voigt. SEE also Dietrich-Loretz, Hayes, Zevit
VARIA:	BERBER: Cohen; CUSHITIC: Cohen, Gragg, Hodge; EGYPTIAN: Meltzer, E.; HAUSA: Newman; INDO-EUROPEAN: Puhvel

VOCALIC LENGTH AND CENTRALIZATION IN TWO BRANCHES OF SEMITIC (ETHIOPIC AND ARABIC)

JEAN LOWENSTAMM

Université du Québec à Montréal¹

O. Introduction

The aim of this paper is to offer a principled account of historically independent, but formally related, developments in two branches of the Semitic family, viz. the rise of central vowels in Maghreb Arabic and Ethiopic.² The facts of Ethiopic are perhaps less well known and will be presented in more comprehensive fashion. Only later in this paper will the Maghrebian data be introduced.

1. The problem

Ethiopian Semitic displays remarkable unity. Most striking among the factors responsible for this perception is its array of vowel systems. Indeed, the vowel system of most of the best understood languages, Ge'ez, Tigrinya, Tigré, Amharic, and some of the Gurage languages can be shown to reduce to the fundamental set shown in (1b), along with that of Proto-Semitic (1a) from which it is usually assumed to derive.

- 1 Research for this work was supported by grants CRSH #411-85-0012, and FCAR #87-EQ-2681. I am grateful to Christian Dunn, Mohamed Guerssel, Isabelle Haik, and Jean-François Prunet for their comments on this paper.
- 2 A caveat is necessary regarding the use of Ethiopic, here. By Ethiopic, I mean all of Ethiopian Semitic from the moment a type recognizable as such emerged, i.e. Proto-Ethiopic, as well as the languages known to us. Obviously, several Gurage languages are almost totally unknown, and the vowel system of Harari is, in my opinion, poorly understood.

(1)

a.			b.	
i, ii	u, uu		i	u
			i	
ee (<ay)	oo (<aw)	>>>>	e	o
			ä	
a, aa			a	

A comparison of (1a) and (1b) immediately reveals that i) no length contrast obtains for the three cardinal vowels in the configuration of (1b), and ii) two central vowels, *i* and *ä*, absent from the proto-system, appear in the Ethiopic daughter languages. Accordingly two questions arise:

1. Under what sort of pressure did Ethiopic develop two central vowels?
2. Was length lost in the course of the history of Ethiopic?

Question 2. can be broken down into two independant subparts:

- 2.a. What role did length play in the development that led to centralization?
- 2.b. What is the current synchronic status of length in Ethiopic?

Due to space limitations, subpart 2.a. only will be discussed in this paper.³

A variety of answers have been given to these questions. It is the purpose of this paper to give a fresh look at the problem.

A rapid comparison with several other Semitic languages reveals that *i* "represents", or "stands for" Proto-Semitic short *i* and *u*, whereas *ä* is the Ethiopic version of *a*; on the other hand, the peripheral vowels correspond exactly to Semitic long vowels of the same quality.⁴

This observation is of paramount importance for it shows that, at the time the Ethiopic innovation took place, the length contrast was well alive. Indeed, it is exactly along this distinction that Ethiopic discriminated between those vowels that were allowed to remain peripheral, or full, and those vowels that were to undergo centralization. It is precisely for this reason, the incontrovertible reality of length at least up to some point in the history of Ethiopic, that question 2a. arises, at all.

³ The reader is referred to Lowenstamm (in preparation) for a more encompassing and detailed discussion of the issue of length in Ethiopic.

⁴ Space limitations preclude presentation of these well known facts. See, e.g. Leslau (1951), and Lowenstamm (in preparation).

The general opinion is that, indeed, length was lost, some time in the history of Proto-Ethiopic, leaving only reflexes in the languages known to us. The historical change is usually characterized as an evolution leading from a system primarily based on quantity to one based on quality.

A typical structuralist account appears in Petraček (1964) who, elaborating on Tubiana (1956), distinguishes several steps leading to a gradual erosion of length. The first blow came from the rise of long mid vowels through the monophthongization of *ay* and *aw*. The absence of short counterparts to these new phonemes weakened the role of length as a source of contrast. Further, length coinciding with height in the case of the pairs *i/ii* and *u/uu* serves only to distinguish between vowels of the same quality. Finally, the "reduction" of short *i* and *u* to *i* leaves *a/aa* as the sole remaining length contrast in the system. By then, the system having almost entirely gone over from quantity-based to quality-based "forces" the replacement of the length contrast *a/aa* by a color contrast *ä/a*.

In contradistinction with the structuralist account above, I will argue that

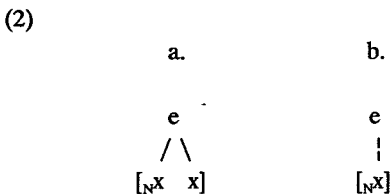
1) the historical change under discussion in this paper did not occur gradually as the result of a number of unrelated developments; rather, its cause is unique and its effects simultaneous.

2) no loss of length is involved;⁵ rather, the sturdiness of long vowels is the very cause of the rise of central vowels, a thesis to be developed shortly after of a brief discussion of the framework within which length will be described.

⁵ As far as I know, the loss of length thesis has been taken seriously for exactly one reason, namely the non-distinctive status of length in (1b): it did not make sense to talk about, say, "long" *i* in the absence of a short *i*. More or less concomitantly with the development of structuralist phonology, the first contacts between linguistic investigators and native speakers revealed that peripheral vowels were not unambiguously longer than central vowels, a discovery which, it was felt, corroborated the systemic irrelevance of length, and, thus, rendered the whole debate pointless. Beyond this, I am not familiar with any single improvement in the analysis of the phonology of an Ethiopian Semitic language that results, directly or indirectly, from having evacuated the issue of length.

2. The treatment of length

In a theory which recognizes a skeletal tier, such as has been proposed in McCarthy (1981), length is factored out of the intrinsic universal properties of individual phonological segments so that there is no such thing as a long i or u, per se. Rather, the length of an i or an u will be entirely a function of the number (1 or 2) of skeletal positions to which it is linked.⁶ Consider the respective representations of long and short e in (2a,b) below.



The picture that emerges from (2) is that an actual vocalic segment is not an unanalyzed entity, rather it is a complex object consisting of three parts: 1) a representation of the vocalic substance under discussion (e in this instance), 2) a nucleus (which may be long, as in (2a), or short as in (2b)), and 3) a representation of the attachment of e to its associated nucleus. In principle, a historical development might involve the loss of any of these theoretical constructs, individually:

- 1. loss of e: the language ceases to display a mid front tense vowel.
- 2. loss of nuclei of the types shown in (2): the language no longer exhibits any long vowels of any type (loss of long nucleus)/the language no longer exhibits any short vowels of any type (loss of short nucleus).
- 3. loss of the kind of link displayed in (2): the language no longer tolerates attachment of e to a long nucleus (while, possibly, still tolerating attachment of other vowels to long nuclei, and of e to a short nucleus)/to a short nucleus (while, possibly, still tolerating attachment of other vowels to short nuclei, and of e to a long nucleus). What emerges from this picture is that loss of long e might have two sources, i.e. loss of long nuclei, as per 2. above, in which case no long vowel of any

⁶ See Lowenstamm & Kaye (1985) for a version of the skeleton as an undifferentiated string of pure positions.

type remains, OR loss of the ability of e to attach to a long nucleus, as per 3. above, in which case the demise of long e does not preclude the survival of other long vowels.

It is usually assumed that the characterization of the relationship between long and short vowels is best expressed in the form of an implicational universal such as (3).

- (3)
- The presence of long vowels in a language implies the presence of short vowels in the same language.*

A theory in which length has been evacuated from the phonological matrix of individual segments, and is represented at the skeletal level, allows in very natural fashion for a weak version of the contrast requirement:⁷

- (4)
- The presence of long nuclei in a language implies the presence of short nuclei.*

(4) says nothing about the kind of material that must be associated with long or short nuclei. Thus, short i (or any other short vowel) signaling the existence of short nuclei would suffice to legitimize long u, even in the absence of a short counterpart to u. Obviously, in this framework the structuralist requirement that a length contrast be recognized only if it obtains for vowels of the same quality represents the strongest possible implementation of (3). Indeed, such a situation would represent a marked case for an additional proviso would be required to guarantee that each vowel of the system **must** appear in both a long and a short form. Such additional condition, I will argue, would preclude the correct characterization of Ethiopic. It is my contention that the system is as in (5b) displayed here with, once more, its ancestor, Proto-Semitic (5a).

⁷ My point is only to show that the contrast requirement can find an expression in a framework in which length is expressed at the skeletal level. Whether such a requirement is empirically correct is a separate question. An assessment of this issue falls beyond the scope of this paper, although I wish to point out that the truth of (4) is not a logical necessity.

(5)

a.			b.		
i, ii	u, uu		ii	uu	
			i		
ee (<ay)	oo (<aw)	> > >	ee	oo	
			ä		
a, aa			aa		

In the next section I introduce the basic elements of a formal system for the representation of vowels, the system in terms of which my claim will be formally expressed.

3. Organization of Vocalic Systems and the Makeup of Ethio-Semitic

In this section, I will briefly recapitulate the essentials of the system of representation of vowel systems advocated in Kaye et al. (1985). One of the fundamental claims embodied there, is that the vowel systems of the languages of the world can be derived from three elements and their combination(s): A, I, and U defined in terms of distinctive features as shown in (6).⁸

(6)

	-ROUND		+ROUND		-ROUND
I =	<u>-BACK</u>	U =	+BACK	A =	+BACK
	+HIGH		+HIGH		<u>-HIGH</u>
	-low		-low		+low

The underscored feature in each of the above matrices is the feature the value of which is "marked" (in the sense of a theory of markedness such as that of Kean (1975)), the "hot" feature of the element. Accordingly, the nature of the unmarked vowel or "cold" vowel, v, can be derived: it is the vowel whose features are all unmarked. It represents pure noise.

⁸ ATRness plays no role in the systems under scrutiny in this study, and will, accordingly, not be discussed. See Kaye et al. (1985) for discussion.

(7)

	-ROUND
v =	+BACK
	+HIGH
	-low

Each element defines its own level of representation labeled according to the feature for which it is marked. I being marked for its value for the feature Back resides on the BACK tier, A resides on the HIGH tier, etc., Thus, a phonological representation can be viewed as a bidimensional grid consisting of horizontal lines, the feature tiers, on which elements appear, and vertical lines linking elements to the skeletal tier. Any intersection may be occupied by an element; in the absence of an element, the position is occupied by the cold vowel, as shown in (8).⁹

(8)

BACK	-----I-----v-----v-----
ROUND	-----v-----U-----v-----
HIGH	-----v-----v-----A-----
	x x x
	[i] [u] [a]

While elements are described in terms of features, the elements themselves, not the features, are the ultimate constituents of phonological analysis. Indeed, features cannot be accessed freely. Rather, the set of value changing operations is highly restrictive, and reduces, in fact, to one function: combination. Elements may combine according to a formula: for any pair of elements X and Y, either X or Y is the head of the combination, the other being the operator (by convention the head appears on the righthand side of the expression (X.Y)). The resulting segment consists of all the features of the head, except that the operator has contributed the value of its hot feature. As may be expected from such a distinction between roles, combination is an essentially asymmetrical operation. Indeed (I.A) is not equivalent to (A.I), as can be seen from (9.a,b).

⁹ The cold vowel having no mark resides on any tier.

(9)

a.

-ROUND	-ROUND	-ROUND	-ROUND	-ROUND-	-ROUND
<u>-BACK</u>	+BACK -->	<u>-BACK</u>	+BACK	<u>-BACK</u> -->	<u>-BACK</u>
+HIGH	<u>-HIGH</u>	<u>-HIGH</u>	<u>-HIGH</u>	+HIGH	<u>-HIGH</u>
-low	+low	+low	+low	-low	-low
I.A	-->	[æ]	A.I	-->	[e]

b.

In a sense, [æ] is nothing but a fronted [a], whereas [e] is nothing but a lowered [i]. The way elements combine is not unlike combinations of primary colors: depending on whether red or yellow dominate in any particular combination the resulting orange will be more red-like or more yellow-like.

In principle, elements may combine freely. Yet, it is a truism that 1) individual vowel systems differ from one another, 2) the sets of vowels displayed by any of the extant vowel systems is vastly inferior to the total of possible combinations of elements. At the same time, vowel systems are not arbitrarily structured. Thus, no vowel system exclusively consists of, say, the set {æ, ö, u}, or {i, ü, u}. Evidently, for every language a number of parameters define the set of legitimate combinations. Consider, for instance the case of front rounded vowels. Not every language has ü and ö. In an elemental framework, roundness involves the implication of U, and frontness that of I. Consequently, front rounded vowels result (in part) from a combination of I and U. The autonomy making it possible for them to combine is merely a reflection of the distinct status of the BACK and ROUND tiers on which they reside. The non-distinctness of these tiers precludes the existence of a series of front rounded vowels. Thus, a parameter of vowel systems can be identified, (10).

(10)

The BACK and ROUND tiers are fused YES/NO

Selecting the YES option, along with setting several other parameters to be discussed below, allows for the derivation of a five vowel system such as that of Modern Hebrew, viz. {a, i, e, u, o}, represented in (11).

(11)

BACK/ROUND	--I--U--I--U--v--
HIGH	-----v-----v-----A-----A-----A-----
	[i] [u] [e] [o] [a]

It should be noted that in a system like (11) in when I and U combine with A, the combination always results in a mid vowel. To the best of my knowledge, there exists no system in which such combinations exclusively yield low vowels, as in a putative set exhaustively consisting of the three cardinal vowels plus a low front vowel, and a low back rounded vowel. Since the difference between, say, a low front vowel and a mid front vowel is entirely a function of the roles of I and A in their respective characteristic expressions (I.A = æ, A.I = e) as was seen above in (9), a further parameter can be identified

(12)

An expression involving elements residing on the BACK/ROUND line must be headed by such elements YES/NO

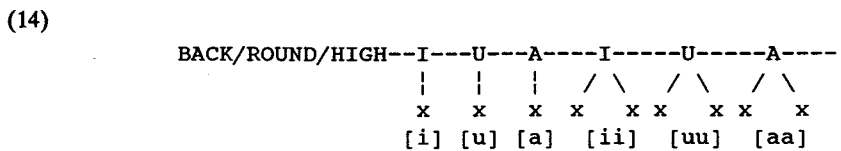
If YES is selected no low front, or low back vowels will be generated. If NO is selected both low front, low back and mid vowels will be generated. Accordingly, the presence in a system of low front and back vowels entails the presence of mid vowels, but not conversely.

A system limited to the three cardinal vowels, such as Classical Arabic differs from that of Modern Hebrew by the absence of mid vowels. Again, e and o result from the combination of A with I and U, respectively. Such a combination, inevitable in a two line system such as (11), cannot arise when all three tiers, BACK, ROUND, and HIGH, are fused. A further parameter is identified, (13).

(13)

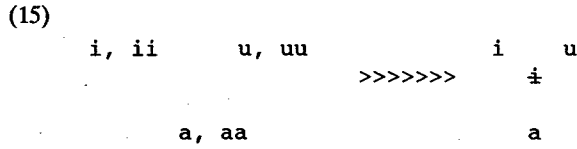
The BACK, ROUND, and HIGH tiers are fused YES/NO

When the YES option is retained, a three vowel set arises with no possibility of deriving mid vowels. As pointed out earlier length is represented at the skeletal level. Thus, Classical Arabic's six vowels can be represented as in (14).



4. Classical Arabic and Moroccan Arabic

In the previous section we just saw what parameters are involved in the derivation of the vowel systems of Classical Arabic and Modern Hebrew. Before returning to Ethiopic, the main topic of this paper, I would like to pause briefly to consider the change that led from Classical Arabic to the modern Arabic dialects of the Maghreb. This short case study will provide the opportunity to introduce additional relevant notions. The dialects of the Maghreb are usually said to have lost the short vowels of Classical Arabic and to have developed a fourth central vowel, as shown in (15) below.



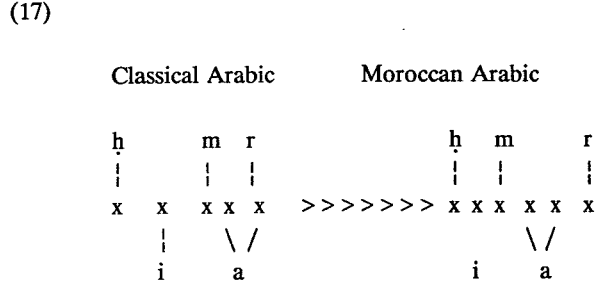
That the remaining vowels correspond exactly to original Classical Arabic long vowels can be seen from the comparisons in (16).¹⁰ As well, it can be seen that the central vowel, or no vowel at all, appears where Classical Arabic had a short vowel.

¹⁰ Whether the modern Arabic dialects of the Maghreb have Classical Arabic as their ancestor, as I assume, may be controversial. What is uncontroversial is the nature of the differences between the vowel systems of these dialects, on the one hand, and that of Classical Arabic on the other hand.

(16)

Class. Arabic		Moroccan Arabic	
taktubu	--->	t-ikt-ib	"you are writing"
taktubuu	--->	t-ikt-ibu	"you are writing"
ḥimaar	--->	ḥmar	"donkey"
kariim	--->	krim	"generous"
muslim	--->	m-isl-ɨm	"muslim"
mubaarak	--->	mbark	"blessed"

A question arises, though, in connection with the scheme of (15): why is it that when three vowels, the short ones in this case, drop out of a set of six, the resulting set comprises four, not three vowels? I submit that the answer lies in what I informally referred to as the loss of brevity thesis. It runs as follows: the remaining peripheral vowels of Maghrebian Arabic never ceased to be long. That is, the dialects of the Maghreb did not lose long vowels, rather, they lost the ability to associate peripheral vocalic material to non-branching, or short nuclei. As a result all short nuclei were depleted of their vowels. When the grammar does not demand the phonetic interpretation of a nucleus, it remains empty, otherwise it is realized as ɨ. In other words, the distribution of ɨ is entirely controlled by phonotactics.¹¹ This is illustrated with the example of the word for donkey.



Upon loss of brevity, the condition that peripheral vocalic material be associated with branching nuclei is not met in the case of the first syllable. As a result ɨ drops.

¹¹ No attempt will be made to document this point, here. The reader is referred to Kaye et al. (1986), Kaye et al. (1989), Kaye (in press), and Kabbaj (1990) for discussion.

No such problem arises in the case of the second syllable. Accordingly, the association of a to its nucleus is unaffected.¹²

I submit that the formal expression of the loss of brevity thesis in such a framework is as in (18)

(18)

*Vocalic elements must be associated with branching nuclei*¹³

Let us now examine the consequences of the introduction of such a parameter into the vowel system of Classical Arabic, by considering the fate of short u, a, and i. Their representation prior to the introduction of (18), appears in (19a). When the vocalic elements cease to tolerate association to a non-branching configuration, i.e. (19b), they are automatically replaced by y (19c). The resulting expression is y in all three cases.¹⁴ With the three intact long vowels, the resulting set is precisely that of the dialects of the Maghreb, {a, i, u, -i}.

(19)

a.	b.	c.
	A I U	
B/R/H--A--I--U--	B/R/H--0--0--0--	B/R/H--v--v--v--
x x x	x x x	x x x
[a] [i] [u]	[] [] []	[±] [±] [±]

¹² For reasons lying beyond the scope of this paper an initial nucleus remains empty when not followed by a consonant cluster, thus *hmar* vs. *yiktib*. See the references of the preceding note for discussion.

¹³ In terms of a theory of phonological government, the expression of (18) is 'vocalic elements must govern'. See Guerssel & Lowenstamm (in preparation), Kaye et al. (1989), and, for Ethiopic specifically, Lowenstamm (in preparation).

¹⁴ There is considerable evidence that the three remaining vowels continued to behave as long nuclei, cf. Kabbaj (1990), Kaye et al. (1986), Kaye (in press).

5. Ethiopic

Neither Proto-Semitic nor Ethiopic display front rounded vowels. Nor do they show low front or low back vowels, although mid vowels are present. This I interpret as positive answers to parameters (11) and (12). In other words, the BACK and ROUND lines will be fused, and any expression involving I or U will be headed by I or U. The relevant parameters and the specific answers made to them appear in (20). Moreover, I submit that Ethiopic diverges from Proto-Semitic in exactly the same way as Moroccan Arabic diverges from Classical Arabic, i.e. by restricting attachment of peripheral vowels to branching nuclei (parameter (18)). Accordingly, their respective answers to the introduction of parameter (18) should fall out from the differences between the makeup of their respective vocalisms, as they are defined above.

(20)

	Classical Arabic	Moroccan Arabic	Proto-Semitic	Ethiopic
Parameter (13)				
BACK/ROUND/HIGH	YES	YES	NO	NO
fused				
Parameter (10)				
BACK/ROUND	DNA	DNA	YES	YES
fused				
Parameter (18)	NO	YES	NO	YES
"Branching"				
Parameter (12)	DNA	DNA	YES	YES
I/U heads				

Ethiopic is as in (21), with the three expressions whose nuclear attachment falls prey to parameter (18) at the rightmost end of the chart.

(21)

BACK/ROUND	-I	-U	-I	-U	-v	-I	-U	-v
HIGH	-v	-v	-A	-A	-A	-v	-v	-A
	/ \	/ \	/ \	/ \	/ \	?	?	?
	x	x	x	x	x	x	x	x
	[ii]	[uu]	[ee]	[oo]	[aa]	[i]	[u]	[a]

The only difference between Arabic and Ethiopic is the autonomy of the BACK/ROUND and HIGH lines in Ethiopic but not in Arabic. The consequence of this autonomy is, of course, that mid vowels are possible in Ethiopic through the combination of two elements, but also, and perhaps not as conspicuously, that every other expression, even if it comprises one element only, is complex in the sense that it appears in combination with the cold vowel, *v*. We saw that Moroccan Arabic's response to the introduction is wholesale delinking from a short nucleus. Ethiopic faces the same problem, but its compositionality, in the sense just defined above, affords an alternative to radical delinking: reversal of the head/operator roles, as in (22).

(22)

$$v.A \text{ ----> } A.v$$

This logical possibility available within the theory makes exactly the right empirical prediction, viz. a low central vowel is derived. To put it another way, the *a* of Arabic and the *a* of Ethiopic are not exactly the same objects: the *a* of Arabic is a pure *a*, whereas the *a* of Ethiopic is, under normal circumstances, an *a* vacuously affected by its operator, the cold vowel. The same phonetic result will be derived in both cases. Under the pressure of circumstances, the introduction of parameter (18) in this instance, their differential nature will be revealed: Arabic *a* cannot show any flexibility and must delink; Ethiopic *a* remains, albeit not in unadulterated form. Turning now to the high vowels *u* and *i*, we can see that, in sharp contrast with Ethiopic *a*, they undergo the exact same fate as their Moroccan analogues, delinking. Two explanations suggest themselves. If the role reversal strategy invoked in the case of *a* were implemented, here, as shown below in (23), a vowel of exactly the same quality, a full *i* or *u* would be derived.

(23)

BACK/ROUND	-I	-U		BACK/ROUND	-I	-U
HIGH	-v	-v		HIGH	-v	-v
	?	?			x	x
	x	x			[i]	[u]
	[i]	[u]				

Indeed, the combination of the cold vowel *v* with I or U is the only instance where the asymmetric nature of the operation does not result in a phonetic difference: *v.I* is an I vacuously affected by a null operator (= [i]), and *I.v* is a high central vowel fronted by the hot feature of its operator (= [i]). It might be argued that a transparency condition is at work, here, whereby, role reversal cannot result in the derivation of a phonologically ambiguous object. This objection will be set aside for two reasons. First, the alleged ambiguity would not result in total opacity: the "inverted" *i* would still be distinguishable from the other *i* by length. Indeed, the former would be short while the latter would be long, just like the "inverted" *a* ([ä]) is short whereas the unadulterated *a* is long. Second, there are documented cases of languages exhibiting the two kinds of high vowels, the one headed by I, or U, and the kind headed by the cold vowel in the absence of a length contrast (cf. n. 15). There is a more valid reason to block the role reversal strategy at hand, namely that the resulting expression would violate the specific setting of parameter (12) enforced in Ethiopic whereby a combination containing I or U **must** be headed by I or U.¹⁵

This being the case, the only response of Ethiopic to (18) must be, as in the case of Arabic, delinking of *i* and *u*. They are immediately replaced by *v*, and a high central vowel is the phonetic result.

In terms of this analysis, Ethiopic *ä* and *i* are rather different phonological objects: *ä* is, in a sense, a real vowel, the short form of *a*, whereas *i* is nothing but the sort of pure noise that will provide phonetic interpretation for empty nuclei

15 Work in progress by Christian Dunn (Dunn, in preparation) indicates that Hungarian has both kinds of [i], *v.I*, and *I.v*. The first type is harmonically active, while the other is "transparent". This happens to correlate exactly with a negative setting of parameter (12). Indeed, Hungarian has obviously relaxed the requirement that I or U always head the expressions in which they are included, to wit the low front vowel *æ* of Hungarian, and its back counterpart.

when such is required. In other words its distribution should be the same as that of Moroccan Arabic *i*, modulo the phonotactic differences between the two languages.¹⁶

6. Conclusion

In this paper I have proposed an explanation for the rise of central vowels in two branches of the Semitic family, Maghreb Arabic and Ethiopic. The differences in the output configurations follow from the respective settings of a small number of parameters, most notably the setting of parameter (18) responsible for what I have called loss of brevity.

BIBLIOGRAPHY

- Dunn, C. (in preparation)
Ph.D. Dissertation, UQAM.
- Guerssel, M. & J. Lowenstamm (in preparation a)
Metathesis in Semitic
- Guerssel, M. & J. Lowenstamm (in preparation b)
Stem Formation and Phonological Structure in Semitic.
- Hetzron, Robert (1964)
La voyelle du sixième ordre en amharique, *Journal of African Languages* Vol. 3, pp.179-190
- Kabbaj, O. (1990)
La structure syllabique de l'arabe marocain: le cas des verbes creux, mémoire de maîtrise, Université du Québec à Montréal.
- Kaye, J. (in press)
Government in Phonology: The Case of Moroccan Arabic, *The Linguistic Review*.

- Kaye, J., M. Echchadli & S. El Ayachi (1986)
Les formes verbales de l'arabe marocain, *Revue Québécoise de Linguistique*, Vol. 16, No. 1.
- Kaye, J.D., J. Lowenstamm & J.R. Vergnaud (1985)
The Internal Structure of Phonological Elements; a Theory of Charm and Government, *Phonology Yearbook* 2, pp. 305-328.
- Kaye, J.D., J. Lowenstamm & J.R. Vergnaud (1989)
Konstituentenstruktur und Rektion in der Phonologie, *Linguistische Berichte, Sonderheft 2/1989*, pp. 31-75.
- Kean, M.L. (1975)
The Theory of Markedness in Generative Grammar, Ph.D.Dissertation, MIT.
- Leslau, W. (1951)
Le type läbsä en guragué, *Rassegna di Studi Etiopici*, pp. 85-98.
- Lowenstamm, J. (in preparation)
Vocalic Length in Ethiopic and Related Issues.
- Lowenstamm, J. & J.D. Kaye (1985)
Compensatory Lengthening in Tiberian Hebrew, In L. Wetzels & E. Sezer (eds.) *Studies in Compensatory Lengthening*, Foris, Dordrecht. pp. 97-132.
- McCarthy, J. (1981)
A Prosodic Theory of Nonconcatenative Morphology, *Linguistic Inquiry*, Vol. 12, pp. 373-418.
- Petraček, K. (1964)
Zur Entwicklung des phonologischen Systems des Altäthiopischen, *Rassegna di studi etiopici*, 20, pp. 129-132.
- Tubiana, J. (1956)
Système vocalique du guèze (éthiopien classique), *GLECS* 7 (1954-1957), pp. 81-82.
- Voigt, R.M. (1983)
The Vowel System of Ge'ez in S. Segert & A. Bodrogligeti (eds.) *Ethiopian Studies Dedicated to Wolf Leslau*, Otto Harrassowitz, Wiesbaden, pp.355-362.

¹⁶ This schwa mobile behavior of *i* but not *ä* is well known and has been studied by Hetzron (1964).