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THE ADEQUACY OF THE FEATURES TONGUE ROOT POSITION, HIGH,
LOW AND BACK IN A COMPARISON OF ASPECTS OF RENDILLE AND SOMALI
PHONOLOGY.

Seminar Paper

Course: Historical and Comparative Linguistics

2nd year MA

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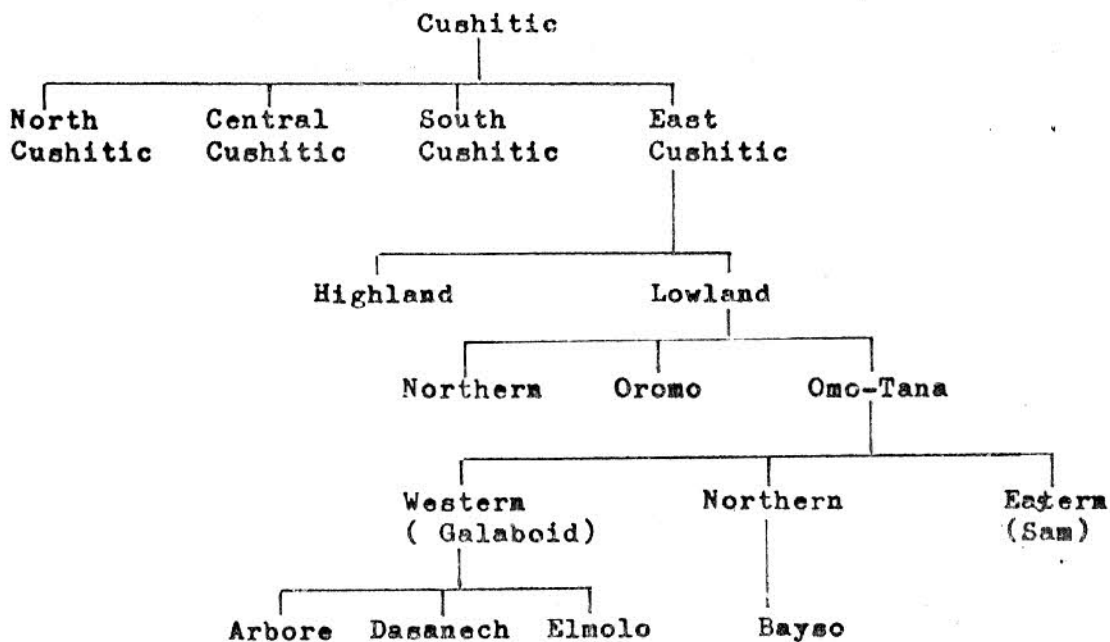
Antoinette J.G. Oomen-van Schendel

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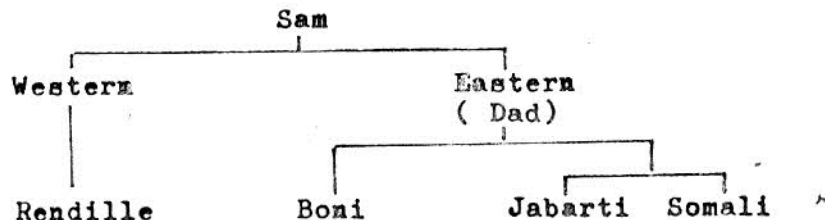
1. Position of languages.

According to Heine (1976 b), Rendille and Somali belong to the Sam-group of Cushitic languages, which form a sub-family of the Afro-Asiatic (Erythraic) language family.

Within Cushitic, the genetic position of Sam can be described by means of the following tree diagram (Heine:1976 b) :



The Sam languages which form the Eastern sub-group of Omo-Tana, are sub-classified in the following way (see Heine 1976a: 3):



(The term Sam is derived from the root *sam common to the languages of this group)

Heine (1976 b) offers the following phonemes, as belonging to the hypothetical ancestor language of the present-day spoken Sam languages:

		<u>Consonants</u>									
		Bilab.	Lab. dent.	Dent.	Alv.	Post. alv.	Pal.	Vel.	Uvul.	Glott.	Phar.
Plosive		*b		*t *d		*d	*c	*k *g	*q	*ʔ	*ʔ
Fricative			*f		*s *z				*h		*h
Lateral					*l						
Roll					*r						
Nasal		*m		*n							
Glide		*w					*j				

Most of these consonants occurred both as single as well as double consonants.

Vowels

Proto-Sam had at least the following five vowels:

*i *u
 *e *o
 *a

These vowels occur both as short and as long vowels. Whether there was a third category of vowels, as the semi-mute vowels of Boni suggest, remains to be investigated. Another problem that needs further investigation is whether Proto-Sam may not have distinguished two sets of vowels based on the distinction of tenseness and/or tongue root position.

Tone and Accent. A systematic comparative treatment of tone and accent in the Sam languages has not yet been attempted. From our present

survey (Heine 1976 b), however, it would seem that some

tentative generalizations are possible:

1. It was likely that Proto-Sam was a tone language distinguishing between high (á), low (â) and high-falling tone (ã).
2. One of the functions of tone was to distinguish sex gender of nouns denoting human beings or animals.
3. In addition to three tones, Proto-Sam can be assumed to have marked an accent which in most, though not all cases, coincides with high tone. Whether the accent ('a) had distinctive function remains to be investigated.

Compare the foregoing information, cited from Heine, on tone and accent with Oomen (1977) on Rendille.

Heine (1976b:70) gives the following details concerning the development of the Sam-Languages:

The first split of Proto-Sam separated Rendille, or Western Sam, from the rest of the Sam-Languages, referred to here as Eastern Sam or Dad languages. (The name 'Dad', first proposed in Heine (1976b), is taken from the root *dad common in Eastern Sam, which means 'man'.)

(Oomen: 'man' in Rendille is 'dod', see later in this paper the Rendille-Somali corresponding o-a vowels)

Rendille (cont'd citation from Heine) does not seem to have changed much during its long period of separate development; it has remained the most conservative Sam language. The following phonological changes may be worth mentioning:

1. Post-velar stops became fricatives, thus giving rise to the soundshifts

$$\left\{ \left[\begin{array}{c} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{array} \right] \right\} > \left\{ \left[\begin{array}{c} x \\ \emptyset \\ h \end{array} \right] \right\}$$

2. Proto-Sam *z was palatalized, merging with the semi-vowel y.

The development of the Eastern Sam languages was characterized inter alia by the following phonological changes:

1. The voiceless stops *t, *c and *k became voiced morpheme-internally following vowels:

$$\left\{ \begin{array}{c} [*t] \\ [*c] \\ [*k] \end{array} \right\}_i > \left\{ \begin{array}{c} [*d] \\ [*y] \\ [*g] \end{array} \right\}_i / *V -$$

2. *c in morpheme-initial position became a fricative (*sh).

3. *m was delabialized in word-final position and merged with *n.

4. *z merged with *d.

Note: All the foregoing information, cited from Heine (1976b)

is included in the present paper to facilitate understanding of the Rendille-Somali correspondences, which will be presented later.

Knowledge for example of the Somali voicing-rule will make it easier to decide whether we have to do with a regular correspondence or with a skewing.

Examples from the correspondences which will be presented later:

(Rendille)	(Somali)		
sakal	sagaal	nine	(regular) but:
dakar	takar	camelfly	
mandan	mataan	one of twins	

2. Purpose of the Present Paper

The present comparative study attempts to establish a number of natural classes with binary feature-specification for Rendille, Somali and a hypothetical ancestor language. This feature-specification is shared by consonants and vowels. The features concerned are :
ADVANCED TONGUE ROOT POSITION, HIGH, LOW and BACKNESS.

It will be attempted to explain the assimilating force of the 'emphatic' (if we may call it that) consonants on adjacent vowels and the coming into being of the Somali Vowel-harmony system, which is not shared by Rendille.

All generalizations made concerning the ancestor language have to be viewed as hypothetical.

3. The features

3.1. The Theory

Several feature-characterizations have been offered to describe 'horizontal' (Aoki: 1968), elsewhere called 'cross-height' (Stewart 1971) vowel harmony.

Niger-Congo Kwa is a prime example of this type of partial vowel-harmony. There are thus two sets of vowels and the x-ray tracings published by Ladefoged (1964:38) show clearly that in one set of these vowels the pharynx is more constricted than in the other and that the constriction in the pharynx is accompanied by a noticeable elevation of the larynx. Chomsky and Halle (1968:314) venture to suggest that this difference corresponds to the difference between the vocal tract positions in open and covered singing. Consequently they have called their feature 'covered-noncovered'. They state as well: "as far as we know, this feature is restricted to vowels and is found primarily in the West-African languages exhibiting vowel-harmony. It is possible however that it has a wider utilization."

I will attempt to show in this paper that it has indeed a wider utilization, i.e. not only geographically, but also outside the vowelrealm, that is resp. in the Cushitic languages and in the consonantsystem.

Stewart (1971) offers the term 'Advanced Tongue root position - retracted tongue root position. Instrumental phonetics (x-ray) supports Stewart's claim that the tongue-root position is advanced for the relatively high set of vowels, producing a raising of the high part of the tongue and a wider pharyngeal cavity, which accounts for the breathy bright quality sometimes associated with the set.

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It is unimportant which term is used, as long as the two main characteristics are remembered:

- 1) constriction in the pharynx.
 - 2) elevation of the larynx.
- } characteristic of -ATR.
or retracted tongue-root position.

It is interesting to compare at this point with what Armstrong (1964) says about Somali d (post-alveolar). "The sound is produced with the same pharyngeal contraction and the same raising of the larynx as is necessary for the articulation of ' and h."

The same two characteristics seem to apply to the so-called 'emphatic' (or pharyngalized) consonants of Arabic. (Salman H. Al-Ani: 1970):
t, d, s and l.

Yusmanov (1961) states that the Arabic 'emphatic' consonants were in antiquity voiced.

We have seen that the feature Advanced/retracted tongue root position, (from now on +/- ATR) characterizes the position of the tongue-root, retraction of the tongue-root causing the constriction in the pharynx.

Chomsky and Halle (1968: 304) present three features which characterize the placement of the body of the tongue. These three features are: 'High-nonhigh', '^uLow-Nonlow and 'Back-Nonback'. If we assume the neutral position of the body of the tongue to be raised and fronted, approximating the configuration found in the vowel e in English "bed", the three features characterize the various displacements of the tongue body from the neutral position.

HIGH-NONHIGH : High sounds are produced by raising the body of the tongue above the level that it occupies in the neutral position; nonhigh sounds are produced without such a raising of the tongue body.

LOW-NONLOW : Low sounds are produced by lowering the body of the tongue below the level that it occupies in the neutral position; non-low sounds are produced without such a lowering of the body of the tongue.

BACK-NONBACK : Back sounds are produced by retracting the body of the tongue from the neutral position; Nonback sounds are produced without such a retraction from the neutral position.

At first sight it might appear that the features +/- BACK and +/- ATR are the same or at least overlap, but this is not the case.

The former characterizes tongue-body position, the latter tongue-root position. Thus for example Rendille post-alveolar d and dental d have the same specification for backness (-BACK), but differ as to the feature ATR. (post-alv. d being -ATR and dental d being +ATR.)

The features relating to the body of the tongue are useful in several ways. Firstly, the four points of articulation of the consonants which are both noncoronal and nonanterior: the palatals, velars, uvulars and pharyngeals, are readily captured:

	palatals	velars	uvulars	pharyngeals
high	+	+	-	-
low	-	-	-	+
back	-	+	+	+

Chomsky and Halle say that there is no language known to them which has all four types of consonants in this table, but if we take Heine's phoneme inventory of Proto-Sam for granted, we have found one. (Rather Heine has found one.) *Rendille and Somali as well.*

Secondly, with consonants, which are anterior and/or coronal, the features HIGH, LOW, and BACK may be used in a natural way to characterize subsidiary consonantal articulations such as palatalization, velarization and pharyngealization. These subsidiary articulations consist in superimposing vowel-like articulations on the basic consonantal articulation. In palatalization the superimposed subsidiary articulation is i-like; in velarization ɤ-like; and in pharyngealization a-like.

Palatalized consonants are therefore high and nonback, velarized consonants are high and back, and the pharyngealized consonants are low and back. On the other hand consonants neutral with respect to pal., vel. and phar. are nonhigh and nonback.

Thirdly, the same three features can be used to characterize the same articulations when they appear in vowels. (Chomsky and Halle: 306)

For example:

	i	e	a	o	u
high	+	-	-	-	+
low	-	-	+	-	-
back	-	-		+	+

3.2. Application

Two vowels with feature-specification (LOW, +/- ATR) are phonetically [ɐ] and [a] and the effect of tongue-root position here will be minimal, so that it is natural to find that the sets of vowels often have a common single member a. (Sim: 1977) (Oomen: true for Rendille)

Also the vowels i and ü with (+HIGH, -/+ATR) will be an awkward combination which is again born out by finding these often merged to single members i and u. (Ford: through Sim:1977).

This was found to be the case for Rendille where the centralizing and lowering influence is much less audible with vowels having the feature +LOW or +HIGH, than with vowels having the features -LOW, -HIGH. From comparative influence this holds also for the ancestor language. (see further on in this paper.)

The features HIGH, LOW and BACK then appear to regulate the degree of retraction of the tongue-root and consequently the degree of constriction in the pharynx. It is noticeable that in Rendille and presumably, also in Somali and the ancestor language k (+BACK, +LOW) has the greatest degree of constriction and consequently the greatest centralizing and lowering effect on adjacent vowels. d (-BACK, -LOW) at the opposite end, has a lesser degree of constriction and therefore its influence on adjacent vowels is in present-day Rendille less audible.

At the systematic phonetic level then, it appears that binary features do not suffice to describe adequately the complexities of the sounds, we are discussing.

We seem to touch upon all the problems, Ladefoged points out, (Ladefoged 1972: 103-104) when he discusses the adequateness of the Chomsky and Halle features for vowels and sounds produced in the glottal-pharyngeal region. As he says, that it is probably not profitable to resolve the differences at this stage, as more data are needed, we shall continue using the features proposed in this paper and return to the problem towards the end of the paper.

It is however already suspected, that we shall need multivalued features to describe height and backness, and/or tongue/tongue-root retraction at the systematic phonetic level. There seems to be no doubt though ~~xxx~~ that, as Jacobson (1962) has repeatedly pointed out, the binary principle is a major factor in human communication. (ladefoged 1972: 91.)

In the languages under study it appears that sounds characterized by +ATR and sounds characterized by -ATR are incompatible.

In cases where a -ATR consonant and a vowel meet, are adjacent, several changes may happen to solve the incompatibility. (Note that we have opted for consonants, being specified for ATR and for vowels being unspecified for this feature, by putting it this way!) (that is at the classificatory level)

~~xRixxpoxsxbkxoxhxngaxxxx~~

The vowels could then be said to be more or less compatible with retracted tongue-root position.

The possible changes are:

- 1) The consonant changes:
 - a. changes feature specification
 - b. drops out
 - c. changes and the adjacent vowel changes.
- 2) The vowel changes, i.e. adopts the feature -ATR from the adjacent consonant.

The hypothesis being put forward in this paper is as follows:

The common ancestor language used all options mentioned under 1 and 2, depending on concomitant specifications for height, and backness associated with the adjacent vowels. After the split Rendille opted for the changes mentioned under 1, while Somali opted for the change mentioned under 2. i.e. more or less, it is probably better to speak of tendencies.

The rule, mentioned under two, was at a later stage lost in Somali, restructuring took place, giving rise to the present-day Vowel-harmony system in Somali. Note that from other Cushitic languages there is no evidence of a vowel-harmony system in existence at the present day.

(Tucker and Bryan: 1966, Heine: 1976b). Rendille as well has no Vowel-harmony system as exemplified from Somali (Gomen: 1977 notes).

Note also in this context what Heine (1976b:73) reports about Boni after it separated from the other Eastern-Sam languages:

'Boni lost all pharyngeal phonemes and the uvular plosive *g.'

4. Transcription

4.1 Consonants

	Bil.	Labio dent.	Dent. Alv.	Post-Alv.	Pal. Alv.	Pal.	Velar.	Uvul.	Pharyng.	Glottal
Plosive	b		t d	<u>d</u>		c j	<u>k g</u>	ʒ		ʔ
Fricat.		f	*z		sh			<u>x</u>	<u>ħ</u>	<u>h</u>
Lateral			l			ly				
Rolled			r							
Nasal	m		n			ny				
Affric.					tc dz					
Glide	w					y	<u>w</u>			

Remarks

Pharyngalized consonants are underlined.

*z is a hypothetical ancestor-language phoneme, postulated by Sassen and Heine (1976b). In Rendille it has the reflex: y, and in Somali: d.

The affricated tc and dz are at least in Rendille in free variation with c and j. dz is as well an allophone of underlying /g/ before high-front vowel in Rendille and Somali. (meat: [dzit]- /gid/)

Several phonological processes, shared by Rendille and Somali, but unimportant to the present discussion, leading to allophones, are not indicated. For example: word-final consonant devoicing, and consonant-lenition intervocallically, giving rise to alternations such as: b - ɸ , d - ɖ etc.

I do not think that there was a phar. plosive in Proto-Sam, as Heine suggests. Armstrong (1964) has only pharyngeal fricatives, voiceless and voiced.

(1971)
(note in this context what Ladefoged on page 41 says: ' in the pharyngeal area no languages use stops (most people cannot make them) ')

It appears that in Rendille (own observation) there is only the pharyngeal

fricative left. (Note in this context Heine's sounskift for Rendille:

Post-velar stops became fricatives, mentioned at the beginning of this paper.)

There is no glottal stop and no glottal fricative. (own observation)

Ladefoged's discussion and examples (1971:41) of contrasts in the pharyngeal-glottal region in relation to phonation-type and place of articulation are particularly interesting and suggest that a more experienced phonetician than myself is required to arrive at a fair statement. Ford, whom I consulted, was of the same opinion, (on Rendille h), but suggested that the friction need not necessarily be at the point of articulation. Thus Rendille h might be called glottal instead of pharyngeal.

Armstrong (1964) has for Somali a glottal stop, a voiceless and voiced pharyngeal fricative and a glottal fricative.

The distinction between w and w is based on comparative evidence:

Examples of the bilabial glide:

(Ancestor L.)	(Rendille)	(Somali)	
bol or 'oowl	hœ l	'aawl	gazelle
gos or 'gows	gös	goews	mola t tooth
kow	köw	kœ w	one
<u>dow</u>	<u>döw</u>	<u>dœ w</u>	near

Note that in closed syllables the diphthong is lost in Rendille.

From Armstrong's examples, it appears that all Somali diphthongs ending in y and w, in closed syllables, precede dental-alveolar consonants only.

Further evidence is needed to decide whether the proto-language had diphthongs in closed syllables.

Examples of the labialized velar:

hawan	hagan	habban	good
wor(r)	wor	war	news
wi(i)l	wel	will	child
towon	tomon	toban	ten

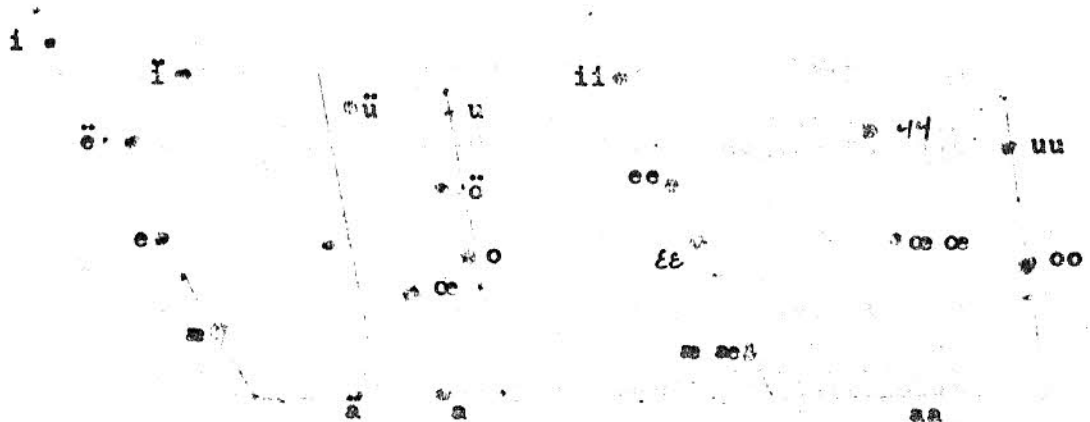
ly and ny occur in Rendille only.

4.2 Vowels

Oomen for Rendille

Armstrong (1964) for the long
vowel-phonemes of Somali.

Seen here in relation to the positions of the Cardinal vowels.

Remarks on Oomen's transcription.

The vowels above at the left side are not phonemes. I postulate for Rendille 5 systematic phonemes: i, e, a, o, and u. o and e are in Chomsky and Halle features (-HIGH, -LOW), but ē and e, and ō and o are distinguished by -/+ ATR respectively. All vowels which have an̄ umlaut and æ and œ as well are to a more or lesser degree centralized and lowered caused by an adjacent -ATR consonant. This centralizing and lowering effect may be again to a more or lesser degree be neutralized by the counter-influence of another adjacent +ATR consonant.

The -ATRconsonant, especially the one backed by +LOW,+BACK, i.e. h is usually dominant. It is interesting to compare at this point with what Yushmanov (1961: 12) says about Arabic: " Arabic vowels assume the coloring of neighbouring sounds. Emphatic (pharyngealized) sounds lend them low timbre. If a word contains consonants of different origin, the vowel-shadings fluctuate, but usually the influence of the emphatic consonant

consonant prevails"and further:"classical Arabic had also two mid-vowels which were quite open and later converged with a."

The vowels ī and ē are very similar, as well as the vowels ū and ō, perhaps more similar than is indicated in the vowel-triangle.
ē and e, and ō and o also

Remarks on Armstrong's transcription.

Because of the limitations of my typewriter, Armstrong's ɛ will be transcribed as e, her ɥ as ü, and her e as ē

Armstrong says:" It may be pointed out here in defence of the inclusion of e, æ, œ and ɥ among the essential vowels of Somali, that neither vowel-harmony nor the influence of neighbouring consonants can account for the occurrence of these vowels in mono-syllabic words pronounced in isolation; the fact that e can occur under exactly the same conditions as ɛ, æ as a, œ as o and ɥ as u must be regarded as proof that these pairs of vowels belong to different phonemes." I do not believe that this is true and will come back to this matter at a later point.

It must be kept in mind that Armstrong wrote a phonetic study of Somali in 1934

She considers vowel⁹length to be distinctive and presents minimal pairs, tone as well. Oomen (1977) however does not consider vowellength to be phonemic for Rendille, but a concomitant feature of high tone+stress (prominence), while tone is considered phonemic in Rendille.

Andzejewski (1955) assumes 2 vowel series for Somali, series A and series B, the backforms and frontforms resp.

Each series has 5 short and 5 long members, corresponding to each other.

He presents them and compares them with Armstrong's notation as follows:

Series A (backforms)		Series B (frontforms)		(For comparison: Bell
Andr.	Armstrong	Andr.	Armstrong	has only one series)
(i)	i	[I]	i	i
(e)	ɛ	[e]	e	e
(a)	a	[a]	æ	a
(o)	o	[o]	œ	o
(u)	u	[u]	y	u
and 5 corr. long vowels		and 5 corr. long vowels.		

Note that Armstrong has i for both series, and that is the cause, according to Andzejewski, of the many exceptions Armstrong has in her vowelharmony examples following i, on page 149.

In the same article Andzejewski (1955:578) notes in a discussion on the most adequate spelling system for Somali, that the two spelling systems evolved by the Somalis themselves recognize only 5 vowel qualities in the vowel letters of their alphabet, because the native speaker is able to read a text, written that way, without any difficulty.

Neither in the works, I have seen of Andzejewsky (1955, 1964) nor in the study by Armstrong, is attempted to explain where or how the vowel harmony originates. It is only said that the front forms are dominant.

" The root-vowel, if retracted, causes the suffix vowel to be retracted:

Example: hair tin pl: timo (compare Rendille : tim - timo.)

The root-vowel, if fronted, causes the suffix vowel to be fronted. "

Example: ~~axi~~axp~~xxx~~ baby camel nirig pl: nirgoe (R.: nyirax - nyirgo)

Note that Armstrong presents fronted forms for the backforms, for the front-series (-/BACK) she has i, e and æ. and ɛ. Remember that Andzrejewski pointed out that she has i for both series. All this can be explained by the fact that on vowels (-BACK) and to a still greater degree on vowels (-BACK,+HIGH) adjacent consonants (-ATR) have less effect, than e.g. on vowels (+BACK,-HIGH). We shall return to this point later.

5. The data

The present investigation involves around 175 correspondences between Rendille and Somali. The majority of the cognates are nouns; the few verbs will only be used as supporting evidence, as I believe that in Armstrong's verbforms, which have fronted vowels, (her so-called 'short-forms') there are other processes at work than vowelharmony; perhaps regressive influence of a deleted suffix-vowel.

The Somali data are taken mainly from Armstrong (first ed. 1934), a few from Andzrejewsky (1964), a number from Bell (1953) and from Heine (1976). As the above mentioned works were wrätten with entirely different purposes, differences in 'narrowness' or 'broadness' of notation must be expected. For example, Armstrong and Andzrejewski indicate fronted or centralized vowels and vowelharmony, while Bell and Heine do not. For that reason, the source is indicated after data, taken from Andzrejewski, Bell and Heine. The mixture has advantages and disadvantages.

The Rendille data were arrived at by going through the above mentioned works with a Rendille informant, Mr. Bernhard Barchuma Arbele.

One of the appararent shortcomings of this study is, that it is not known what percentage of the total of the Somali data seen, has a regular correspondance in Renille. My Rendille informant could easily have overlooked some. It is nevertheless considered a useful investigation, because all the available litterature confirms the close relationship between Rendille and Somali, (see especially Heine: the Sam-languages:1976)

6. List of Cognates

The Rendille version is on the left side, the Somali on the right.

drink	abhœ b	'æ b, 'ab (B)
uncle	apti	abti (Andr.)
sunday	ähäd	ahad
monday	alasmin	isniin
girls	albe	hablaha, hablo-ha (B)
mouth	af	?af
wednesday	arbäh	arba'a
eat	hüm	'un
mother	ayo	hœ œ yo, hooyo-da (B)
back (bohe)	adäh	adah
milk mixed with water	badäh	badah (Andr)
cockroach	barambaro	barambaro
lake	bey	bad
change	bëdel	beddel
water	bitce	biya-ha (B)
coffee	bun	bun
taste	tcamtcam	daddan
five	tcan	shan
bird	tcimbir	shimbir
melt	daay	dalaal (H)
fire	dab	dab
side	daban	dann
big stone	däddab	daddab
stone	dägäh	dagah
camelfly	dakar	takar
say	däh	deh
drink (milk)	dam	dan
centre	däh	deh
give birth	dël	dal
tall	der	deer
pot	diri	deri (H)
blood	dīg	diig (B)
tortoise	dim	diin
ear	dög	deg (H) (B)
near	döw	äwäwäw döw
suck, lick fingers	dug	düüg

people (collect.)	död	dad
anthill	dundume	dundume
jackal	<u>döwəho</u>	<u>dawa</u> 'o (H)
dust	ëber	<u>habaas</u>
night	ëben	<u>habeen</u>
horse	farat	faras (Andr)
hypnotize	fal	fall
sitting	fiddi	faddi
comb	fil	feed, (fid (B)
far	fög	fog
open	fur	fur
shield	gatcam	gaashaan
camels (collect)	<u>gäl</u>	<u>geel</u>
aim with bow and arrow	gan	<u>gan</u>
horn	<u>gäs</u>	<u>gees</u>
enter	<u>gäl</u>	<u>gal</u>
evening	<u>geleb</u>	<u>galab</u>
tree	<u>gëy</u>	<u>geed</u>
giraffe	<u>gëri</u>	<u>geri</u>
molar tooth	<u>gös</u>	<u>gees</u>
burn	<u>güb</u>	<u>güb</u>
brown	gududan	<u>guduudan</u>
travel by night	gut	<u>guur</u>
camelskin	<u>gög</u>	<u>gees</u>
good	<u>hagan</u> <u>hagan</u>	habban
water container	<u>hän</u>	haan
milk	<u>hünu</u>	'aano
camel	<u>häl</u>	hal
tongue	<u>härab</u>	'arrab
graves	<u>hawalö</u>	habaalö (Andr)
rain	<u>hür</u>	dzirr
vein	<u>hëy</u>	<u>hidid</u>
tie	<u>hüd</u>	<u>hid</u>
arithmetic	<u>hësaptu</u>	<u>hisaab-ta</u> (B)
grass	<u>hoes</u>	'aws
cattle (collect.)	<u>hoela</u>	'üüd
gazelle	<u>ho:l</u>	'aw:l

hole, deep	hōlen	hōlen
heavy	hūri	xuuri
snore	itce	iya
she	itcow	iyo
and	itcök	sheeg
tell	idid	didid
sweat	il	'rid (B)
earth	inam	inan
boy, son	iläh pl:ilko	ilip
tooth	inyet	nia sku
man		
	imat pl:dzitat	didid pl:dzided
kidney	kälasi	kelli
clerk	kärani	karraani
bring	kän	keen
leopard	käbil	shabeel
single	käleey	keli
hoe	kōb	kōb
climb	kōr	kōr (B)
one	kōw	kōw
hot	külel	kull, kulus (B)
hill	kur	kur
hump	kurās	kurus
male	lab	lab
two	lama	laba
bone	laf	laf
baboon	latcer	daayeer -ka
six	lih	lih
cattle	lolyo	lo?
leg	luqun	luqun
heel		
milk (verb)	mal	maal
daytime	malim	maalin
twin	mandan	matæn (Andr)
place	mel	meel
car	mutugäär	moodikäär
blood		
children (collect)	nyedat	nyedat
female breast	nāhāc	naag (B)

peace	nebey	nabad
breath	nebsi	neef-ta (B)
baby camel	nyiräx pl:nyirxo	nirig pl:nirgoe
male camel	or	?aawr
male goat	orgey	œ rgi (Andr)
sun	oräh	gorrah
frog	räh	rah
goats (collect)	ri	ri?
grind	rīg/rir	ridiq (H)
shake	roe h	ruh
rain	rob	roob
police camel	rukub	rakuub
saturday	sabdi	sabti
nine	säkal	sagaal
cow	säh	sa'
box	sandux	sanduuq
nose	sam	sann
three	seyäh	saddeh
eight	siyet	siddeed
sky	serey	'irr
gift	sim	siin
mucus	sim	sin
bed	sirir	sariir
father in law	soyoeh	soddog
mother in law	soyoeh	soddoh
lungs	sombob	sämbab (H)
ghee	subäh	subag (Andr)
wait	süg	süg, sug (B)
seven	teba	toddoba
go away	tab	tag
Monday tuesday	talata	salaasa (Andr)
sew	tol	tol
spit	tuf	tuf
he spat	tufe	tüf
uncastrated ram	tumay	sumal
blacksmith	tumal	tumaal (H)
hair	tim	tin
show	tus	tus
sleep	udur/urd	hurud
turn over	urgi	roe g, rog (B)
stomach	ur	uur

he	usu	wuu/ayyuu
thing	<u>wäläh</u>	<u>wäh</u>
goat	<u>wähär</u>	<u>wəhar</u>
hyena	<u>wäraba</u>	waraabe (Andr)
boy, child	<u>wäl</u>	<u>wiil</u>
rhino	<u>wädzel</u>	<u>wiyil</u> (And)
big	<u>wän</u>	weyn
news	<u>wör</u>	warr
source, well	<u>wör</u>	war
drive a camel	<u>wöy</u>	wad
hold	<u>xäbo</u>	<u>qabo</u>
young camel	<u>xälim</u>	<u>qaalin</u>
thursday	<u>xämis</u>	<u>xamiis</u>
burst	<u>xärad</u>	<u>qarah</u>
cold	<u>xöbo</u>	<u>qabow</u>
bend	<u>xolox</u>	qalloo'i
dig	<u>xöt</u>	<u>god</u>
bite	<u>xänin</u>	<u>ganiin</u> (H)
firewood	<u>xöro</u>	<u>gori-ga</u> (B)
call, speak	yed	yeed
do	yel	yeel
moom	yeyäh	dayah (H)

7. A synchronic rule in Rendille.

In Rendille there appears to be a rule which centralizes and sometimes lowers vowels in the environment of the following consonants:

- d (post-alveolar)
- k, g (velar)
- w (labialized velar)
- x (uvular)
- h (pharyngeal) or (glottal) *see page 74*

These consonants have in common that their articulation is characterized by a constriction in the pharynx, caused by retraction of the tongue-root and a simultaneous raising of the larynx. They will be characterized by the feature -ATR.

The centralizing and lowering effect is most audible with a, (+LOW,+BACK).

Examples: *gir - hir/her rain (compare Somali: dzirr)
*her - her ox (" "
*luq - löh leg (" " lug)
*sozzoq - soyoch father in law " soddog)
*haan - hän vessel " haan

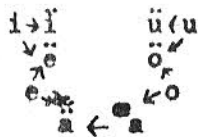
Compare also: in Rendille:

<u>r</u> ix - grind	and	ri - goats
<u>d</u> er - tall	"	mel - place
<u>g</u> äl - camels	"	laf - bone
<u>w</u> ör - news	"	tol - sew
<u>l</u> ih - six	"	tim - hair

The lowering effect seems to be restricted to a (+LOW), but with data like:

<u>g</u> o <u>e</u> g - camelskin	(Somali: g <u>o</u> g; Beil:gog)
<u>k</u> o <u>e</u> w - one	(" k <u>o</u> w; " kow)
<u>d</u> o <u>e</u> w - near	(" d <u>o</u> w; " dow)

where the vowel is surrounded by two of the above consonants, the lowering is present. Remember in this context the possible counter-influence of another adjacent consonant (+ATR,+HIGH) which was mentioned before for Arabic and which also seems to play a role in blocking Somali vowel-harmony. (see later in this paper). The process could thus be viewed as follows.



The following feature specifications are offered then for these 6 'emphatic or 'pharyngealized consonants:

	<u>d</u>	<u>k</u>	<u>g</u>	<u>w</u>	<u>x</u>	<u>h</u>
high	-	+	+	+	-	-
low	-	-	-	-	-	+
back	-	+	+	+	+	+
ATR	-	-	-	-	-	-
voice	+	-	+	+	-	-
round	-	-	-	+	-	-

(all other consonants have +ATR)

Vowels on the other hand are not specified for the feature ATR; they acquire this feature from adjacent consonants by rule.

	i	e	a	o	u
high	+	-	-	-	+
low	-	-	+	-	-
back	-	-	+	+	+

The required assimilation rule is then as follows:

$$\begin{bmatrix} -\text{Cons.} \\ +\text{Voc} \end{bmatrix} \longrightarrow [-\text{ATR}] / \left\{ \begin{array}{l} \begin{bmatrix} +\text{Cons} \\ -\text{Voc} \\ -\text{ATR} \end{bmatrix} \text{ ---} \\ \text{---} \begin{bmatrix} +\text{Cons} \\ -\text{Voc} \\ -\text{ATR} \end{bmatrix} \end{array} \right\}$$

Whereby the features HIGH, LOW and BACK as well on the consonants as on the vowels involved regulate the degree of -ATR.

For example, the pharygealization is most audible in the environment of h, whereas the vowels most susceptible to pharygealization are the mid-vowels (-HIGH-LOW) e and o. (Note in this context that Oosen (1977) already noted variations in what she then considered Height, for the midvowels; the variation is due to a difference in Tongue-root position, caused by adjacent consonants. No differences were noted for the high vowels, - compare Armstrong's one i for Somali!- and for the low vowel.) except in the environment of

Compare the following mid-vowels, on the left in environment of +ATR cons.,
on the right in environment of -ATR cons.:

place - mel	tall - <u>d</u> ēr
heavy - <u>h</u> öles	bring - <u>k</u> ën
father - soyoe <u>h</u>	camelskin - <u>g</u> ög
in law	
eber dust	one - <u>k</u> öw

It appears that, as has been mentioned before on page 15, that in cases where a vowel has on one side a -ATR and on the other side a +ATR cons. the vowel hesitates as it were, between +/- ATR, and perhaps the loss of especially the lowering is best, due to this counter-influence.

Example: camelskin - gög but molar tooth - gös

Note: the w is included on the basis of comparative evidence, as ^{could} will be seen ^{before} later. In the ancestor-language there were presumably w bilabial glide and w labialized velar.

It is assumed then that the presented rule existed in the ancestor-language, together with all the variations due to the features HIGH, LOW and BACK, that these variations developed into vowelshifts in Somali, in fact ^{the} loss of the rule, and inherent restructuring, whereby the underlying Somali-vowels acquired the feature + or - ATR, and consequently the vowel-harmony system came into being in Somali.

Rendille on the contrary kept the rule, but there are a number of consonant-losses and shifts to be seen.

8. Comparative evidence

The following vowel-alternations were found (see Heine, who mentions a correspondence rendille o - Somali a on page 36)

<u>Ancestor language</u>	<u>Rendille</u>	<u>Somali</u>	
$o \rightarrow a$ *wor(r)	wor	warr	news
*wor	wor	war	source
*'o(w)s	hos	'aws	grass
*woz	woy	wad	drive camels
*?o(w)r	or	?awr	camel
*'ol	kol	'awl	gazelle
*dod	dod	dad	people
*mog	mog	mag	debt
<u>finnkhan</u> *towon	tomon	toban	ten
*kob	kob	kab	shoe
*qolo'	xolox	qallo'	bend
*qobo(w)	xobo	qabow	cold
*'ob	hob	'ab	eat
*gos	gos	goe ws	molar tooth
*hog	hog	hoe g	hole, deep
*kow	kow	coe w	one
*gog	gog	goe g	camelskin
(*hooyo	ayo	hoe oe yo	mother)
$o > e$ * dog	dog	deg	ear (in this group the only restructured case. $o \rightarrow e$)

> a	*del	dal	däl	be born
	*gel	gal	gal	enter
	*geleb	geleb	galab	evening
	*hebe(e)n	eben	habeen	evening
	*hebe(e)s	eber	habaas	dust

æ > e	*gaz	gey	gëed	tree
	*gal	gal	gëel	camels
	*gas	gas	gëes	horn
	*dah	dah	deh	say
	*dah	dah	deh	centre
	*kalasi	kalasi	kelli	kidney

Note:

Two-syllable words present additional problems to the comparison, because here other processes are at work, namely the regressive assimilation-process for Rendille, and the progressive assimilation-process for Somali, mentioned by Heine (1976:35). Data like the following are explained by these processes:

* sambob sombob sambab lungs

Note: all data have in common that adjacent to the vowel there is one consonant characterized by the feature -ATR.

The restructuring in Somali can be viewed as follows:

i u
 ↙ ↘
 e o
 ↘ ↙

No examples of restructuring were found for the high vowels i and u, and the low vowel a.

The high vowels i and u show regular correspondances in environment of a -ATR consonant.

* <u>didid</u>	idid	<u>didid</u>	sweat
*dig	dig	dig	blood
*gid	dzid	dzid	meat
*qirr	hir	dzirr	rain
*kimbir	tsimbir	shimbir	bird
*guut	gut	guur	travel at night
*luq	luh	lug	leg
*'i(i)d	il	'iid	earth
*hiziz	h ^é y	hidid	vein
*wi(il)	w ^é l	w ^é l	ch ^é l
*wizil	w ^é lzel	w ^é lil	ch ^é lino

While the vowels are alike, however characterized by the feature $\sqrt{-ATR}$, as can be seen from the vowelharmony in Somali (example: dzid plidzided, and not dzidad), some of the -ATRconsonants are lost or have changed in

Rendille. *d ---> \emptyset
 *q ---> h
 *h ---> \emptyset or remains, but the adjacent vowel changes from i->e.
 *w ---> w

*k and *g palatalize in both languages before i.

It seems that in the ancestor-language k and g fluctuate in the features HIGH and BACK according to adjacent vowels. Compare with:

*guut	gut	guur	travel at night
*kur	kur	kur	hill

This presents an additional problem to the analysis of the feature ATR.

Besides the the a→e correspondances we have seen for *a⁺ ^{in Somali} there are also a-a correspondances in environment of a -ATR consonant.

The change a→e in Somali must have been a-ä-æ -e-ë; the last change only happened in the environment of a strong +ATRconsonant: like l or s
+ HIGH

Example : *ga(a)l -- geel
*ga(a)s -- gees

In the a-a correspondance : (Ancestor-Rendille)

*subaq subah subag ghee

we find another instance of consonant-change in Rendille.

In the correspondances:

*iliq	ilah Pl: ilke	ilig	tooth
*nirig	nyirax	nirig	baby-camel
*sozzoq	soyoh soyoka (this)	soddoq	father in law
*sozzoh	soyoh soyokta (this)	soddoh	mother in law

it can be clearly seen that in Rendille *q has changed to h.

The ^{direction of} change is *q → h and not the other way around as can be shown from

synchronic alternations in Rendille:

ilah - tooth

ilko - teeth

subah - ghee

subaka - this butter

soyoh - father in law

soyekaya - my father in law

compare with: rah - frog
raha- this frog
meh - load
meha- this load

9. Reconsideration of the phonemic status of Armstrong's central rounded vowels o and u and as well of e and ae.

Note firstly that Armstrong's

<u>o</u>	is represented in Bell by <u>o</u>	:	think	mœ œ d - mood
				gras dœ g - doog
<u>u</u>	"	"	u	pearl lüül - luul
				nostril dül - dul
<u>e</u>	"	"	e	tree geed - geed
				camels geel - geel
<u>ae</u>	-	"	a	shop dæ æ s - daas
				axe fæ æ s - faas

Bell does not indicate the differences caused by what is called here tongue-rect position, nor does he indicate vowel-harmony; he mentions however that it exists and refers to Andzrejewski for further information. Remember what was said on page 17 of the present paper about Semali orthograph proposed by native speakers. All this points into the direction of a natural, phonologically conditioned process.

Secondly, looking at Armstrongs minimal pairs involving e-ë, a-ae, o-œ and u-ü, one notices the following points:

In almost all cases there is a -ATR consonant and a +ATR consonant adjacent to the vowel. It has been suggested already that in such a case the vowel hesitates as it were as to the feature ATR. If in addition there is the danger of homophony, one might perhaps expect the two vowels to differentiate into different directions, one -ATR, the other +ATR.

Examples: duul -fly
düül -attack

With the minimal pair: güür - shift
guur - travel by night

one tends to think that the meanings are very similar and that they are the

As far as i is concerned, we saw already that the difference between i and ĩ is minimal, because -ATR is an awkward combination with +HIGH, /BACK. Armstrong's exceptions under i, all contain a -ATR consonant.

dzid -Pl: dzided, dzidoe	road
dih -Pl: dihoe	dry bed of river
nirig-Pl: nirgoe	baby camel.

As far as e, a, o and u are concerned, almost all examples have no adjacent -ATR consonant. If there is one, it is in all cases except on (naag -woman) the initial consonant and not the final. It is assumed here that the expected -ATR vowelharmony is blocked by the counter-influence of the +ATRconsonant medial between the root-vowel and the suffix-vowel.

Examples: 'id - Pl: 'ido	people	(d is dental) (final consonant of root is +ATR)
'ir -Pl: 'irar	sky	"
weel - Pl: weelal	pot	"
koor - Pl: kooro	bell on camel	"
huub -Pl: huubab	membrane	"

Then there is : deh - Pl: deho - centre, where we would have expected dehoe;
Remember this is a restructured form, compare with Rendille : dah - centre.

As far as ii, e, se, ce and ü are concerned however, all examples have a adjacent -ATRconsonant. except some like:

dziirr- Pl: dziirer/dziiryoe	rat	(remember that *g --> dz/ - i) so there is -ATR present)
dæ æ s- Pl: dæ æ syoe-	shop	(the d is a problem, because of the merging of *d and *z to d. More evidence is needed to make more exact statements about the feature-specification of these consonants.)
fæ æ s - Pl: fæ æ syoe -	axe	(no explanation can be offered, except irregularity)
lüül -Pl: lüülel	pearl	(l and d alternate in more cases.)

In view of the apparently complicated history of the birth of the Somali vowel-harmony system, where many contradicting influences were at work, it is proposed here that present-day Somali has ten systematic vowel-phonemes i.e. five characterized by the feature +ATR and five characterized by -ATR. In the course of time, after Rendille split away, the ~~Somali~~ vowels, which were unspecified for ATR, acquired the feature + or - ATR, whereby the -ATR vowels became dominant in the vowel-harmony system.

(Length is left out of consideration, as well as tone, but remember that in Rendille tone was considered distinctive, while length was considered predictable (Oomen:1977))

The fact that the -ATR vowels are dominant and not the more natural +ATR vowels can be viewed as a vestige of the old harmonizing rule, whereby -ATR consonants colored adjacent vowels, which rule is still present in Rendille and something very much like it, as far as my knowledge goes in Arabic and Berber; both languages belong also to the Afro-Asiatic language family. (for Berber see Ladefoged 1971:63)

To go into more detail concerning the Somali vowel-harmony system, is considered outside the scope of the present paper.

1.1 Reconsideration of the proposed features HIGH, LOW, BACK and ATR.

Coming to the end of the paper, I consider the proposed features rather adequate to account for the harmony-processes, consonant-vowel and vowel-vowel in the languages under consideration. More data are needed to arrive at a more precise statement concerning the regulating influence of the features HIGH, LOW and BACK on the tongue-root position.

At one point I considered whether HIGH, LOW and BACK did not suffice.

One possibility is to consider the pharyngealized consonants: d k g w x h of Rendille, (or of the ancestor-language: d k g w g h ' h ?) all characterized by (+LOW, +BACK) as suggested by Chomsky and Halle for secondary articulation; but then we would lose the features HIGH, LOW and Back as place of articulation features not only for the consonants but also for the vowels.

Ladefoged (1971) has proposed a value for backness and height and for place of articulation (the last feature multivalued) (note also that his Height and Backness are defined differently, page 74) for vowels and vowel-like secondary articulations on consonants. He also has a feature TENSION which appears to be rather similar to ATR. He notes that Tension is not a completely independent feature. (I cite, page 75) A low back vowel can be produced only by contracting the muscles which oppose those that pull the root of the tongue forwards; consequently such a vowel cannot be tense in the technical sense defined here etc." All this is rather similar to what has been said before in this paper.

It might be that Ladefoged's nonbinary features for place of articulation and for vowel height are useful to account for the different degrees of centralizing and lowering of vowels in environment of 'emphatic' consonants,

as well as to describe the changes that happen^{ed} to 'emphatic' consonants in Rendille. As long as we have the feature ATR for vowels, combined with the Chomskian features HIGH, LOW and BACK, we do not need multivalued features for vowelheight such as Ladefoged proposes, that is at the classificatory level. Secondly HIGH, LOW and BACK are adequate, as we have seen on page 8 to capture the four points of articulation of the consonants which are both noncoronal and nonanterior: the palatals, velars, uvulars and pharyngeals and this is just what is needed in the present analysis. Another great advantage of the features HIGH, LOW and BACK is that they can be applied to consonants and vowels.

There is one other possible analysis which presents itself to the mind. Instead of characterizing all Rendille 'emphatic' consonants by -ATR, one could consider 3 classes: the velars, the uvular and the pharyngeals; the palatals form the fourth class for the noncoronal and nonanterior consonants. Note in this context that Armstrong apparently considered only d and h and ' as 'emphatic' for Somali.

The classification would then be as follows:

	Pal.	Vel.	Uvul.	Pharyng.	
High	+	+	-	-	
Low	-	-	-	+	
Back	-	+	+	+	
Round	-	+/-	-	-	(needed for the labialized velar)

As has been said before in this paragraph that: HIGH, LOW and BACK are thus lost as place of articulation features, but characterize instead the typical 'emphatic' quality, strongest for h, of the sounds under discussion. Features also on the classificatory level should be based on phonetic facts; Therefore I think the feature ATR more appropriate to account for the

phonetic facts under discussion, that is synchronic and diachronic phonetic facts.

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