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A grammar of Hamar : a South Omotic language of Ethiopia

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2 Phonology and morphophonology

2.1 Consonants

Hamar has 26 well established consonant phonemes. The velar implosive in brackets is attested only in one lexeme and it is considered marginal, see below.

Table 2.1: Consonant phonemes

	Bilabial	Alveolar	Palato-alveolar	Velar	Uvular	Glottal
Stops	p b	t d	c j	k g	q	
Implosives	ɓ	ɗ		(ɠ)		
Ejectives		t'	c'			
Fricatives		s z	sh	x		
Nasals	m	n	ɲ			
Liquids		l, r				
Glides	w		y			ʔ, h

The transcriptions of Hamar data follow a surface-phonemic convention, except when they occur within phonetic brackets. The following modifications to the International Phonetic Alphabet will be adopted: /j/ for what is realized as voiced palato-alveolar affricate [ɟ]; /c/ for the voiceless palato-alveolar affricate [tʃ]; /c'/ for the palato-alveolar ejective affricate [tʃ']; /y/ for the palatal glide [j]; /h/ for the breathy-voiced glottal approximant [ɦ]; /sh/ for the palato-alveolar fricative [ʃ]. The alveolar fricative /s/ never clusters together with the glottal /h/, hence the orthographic convention /sh/ can only be interpreted as [ʃ]. The bilabial stop /p/ can be realized as [p] or [ɸ]. *p* [p] and *f* [ɸ] will be both used in surface-phonemic transcriptions, depending on the actual realization of the phoneme: a word like /payá/ 'good', can be written as *payá* or *fayá*. Similarly, the velar stop and the velar fricative will be written as *k* or *x*: /saká/ 'tomorrow' can be transcribed as either *saká* or *saxá*. Long vowels and geminated consonants are always indicated by doubling the vowel or the consonant symbol, respectively. In surface-phonemic transcriptions word initial glottal stop is not written, except for this chapter. The diacritic /^h/ indicates stress and high tone, and falling tone is written with the diacritic /[˥]/ (cf. 2.4). Monosyllabic CVC word types have no diacritics. Orthographic conventions represent phonemic changes after phonological rules have applied.

2.1.1 Description of consonant phonemes and distribution

A description of each consonant phoneme is given below, followed by examples showing distributional patterns (word-initial, intervocalic, post-consonantal and pre-consonantal, word-final) and occurrences of geminated counterparts. Of all phonemes, 16 can occur word-finally (/p/, /b/, /t/, /j/, /k/, /q/, /ʁ/, /c/, /s/, /z/, /sh/, /x/, /m/, /n/, /l/, /r/). The phonemes /d, c, g, ɗ, ɟ, t, ɲ/ have not been attested in word-final position. The voiceless bilabial, alveolar and velar stops are aspirated in word-initial position, but aspiration is not phonemic. The burst of air comes after the release. The bilabials /p, b, ʁ/ are partially released in word-final position before pause; lenition of stops generally occurs before the vowel /a/. The palato-alveolar stops are phonetically affricates, but they have to be considered mono-segmental since, unlike consonant clusters, they can occur word-initially, word-finally and they can be geminated. The segments /w/, /y/, /ʔ/, /h/ pattern like approximant consonants and never function as the nucleus of a syllable; the glides are deleted under morpho-phonological rule MP2 and MP4 (see 2.5.1). Intervocalic non-pulmonic consonants can be weakened and realized as pulmonic in fast speech. Ejectives cannot be geminated. The nasals /n/ and /m/ are two independent phonemes but the opposition is neutralized in clusters, where they assimilate in place of articulation to the following consonant. The velar nasal [ŋ] is not phonemic: it is always adjacent to a velar and it is analysed as an assimilated /n/. [ŋ] is reported as phonemic in Dime (Mulugeta 2008:9-10), but not in Aari (Hayward 1990:429-431). Word-final sonorants can be partially devoiced.¹¹

The phoneme in parenthesis in table 2.1 are marginal. The status of the velar implosive /ɓ/ is doubtful since it has only one lexical occurrence: *ɓiá* 'hit', see discussion below.

The realization of consonant phonemes is discussed below. For each phoneme, all the possible realizations are given in a table: the underlying phoneme is in the first column, followed by the default realization in the first line of the second column. Allophonic realizations are listed below the default realization, and environments are given in formal notation in the last column. The order of presentation is based on manner of articulation.

/p/	[p]	voiceless bilabial stop	/[_{word} ____ any (see below) /____] _{word}
	[p ^h]	voiceless bilabial aspirated stop	
	[ɸ]	voiceless bilabial fricative	
	[p̚]	partially released bilabial stop	

/p/ is a voiceless bilabial stop

parsi 'ale-gruel beer'

ʔaapó 'mouth'

¹¹ Devoicing of word-final sonorants is attested in Somali (Armstrong 1934; Saeed 1999:10-11).

ʔálpa ‘knife’
galáp ‘yellow’
happá ‘braid hair’

The bilabial plosive /p/ can be realized as [p] or [ɸ] in possibly all contexts, except when geminated and when it clusters together with the bilabial nasal /m/. The realization of the phoneme /p/ as [p] or [ɸ] may vary among speakers and within the same speaker’s speech.

payá	‘good’	[pajá] ~ [ɸajá]
pée	‘land’	[péé] ~ [ɸéé]
piisí	‘placenta’	[piisí] ~ [ɸiisí]
pooló	‘cloud’	[pooló] ~ [ɸooló]
pugá	‘blow’	[pugá] ~ [ɸugá]
ʔárpi	‘moon’	[ʔárpi] ~ [ʔárɸi]
lashpá	‘shoulder’	[laʃpá] ~ [laʃɸá]
ʔapála	‘clothes’	[ʔapála] ~ [ʔaɸála]
ʔaapó	‘mouth’	[ʔaapó] ~ [ʔaaɸó]
ʔeepí	‘dead body’	[ʔeepí] ~ [ʔeeɸí]
ʔudúp	‘pillar’	[ʔudúp˦] ~ [ʔudúɸ]
sómpo	‘lung’	[sómpo]
happá	‘braid hair’	[happá]

Word-final bilabial stops occurring at the edge of a sentence or before a pause are partially released: the release burst is partially audible, or not audible at all. This is indicated only in phonetic transcriptions with an upper-right corner diacritic ˦.

/b/	[b]	voiced bilabial stop	/V__V /___˦˦word
	[β]	voiced bilabial fricative	
	[b˦]	partially released voiced bilabial stop	

/b/ is a voiced bilabial stop

bíiri ‘three pronged stir-stick’
dabí ‘wild animal’
ʔimbá ‘father’
qálbe ‘leaf’
ʔab ‘another’
jibbá ‘dislike’

/b/ can be weakened to [β] in intervocalic position when followed by the low vowel /a/. This lenition can be observed particularly in fast speech:

kubá	‘wall’	[kubá] ~ [kuβá]
gibáz	‘malaria’	[gibáz] ~ [giβáz]
labalé	‘ostrich’	[labalé] ~ [laβalé]

/t/	[t]	voiceless dental-alveolar stop	/[_{word} ___
	[t ^h]	voiceless aspirated dental-alveolar stop	

/t/ is a laminal voiceless dental-alveolar stop. The tongue touches both the upper teeth and the upper alveolar ridge. /t/ is aspirated word-initially.

toré	‘plain’
meté	‘head’
ʔínta	‘I’
gertámo	‘clan’
ʔermát	‘tears’
dettí	‘cow dung’

/d/	[d]	voiced dental-alveolar stop
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/d/ is a laminal voiced dental-alveolar stop. It is not attested in word-final position and it is not lenited before the low vowel /a/.

doobí	‘rain’
ʔoidí	‘four’
ʔindá	‘mother’
qaldó	‘thigh’
puddó	‘thread’

/c/	[tʃ]	voiceless palato-alveolar affricate
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/c/ is a voiceless palato-alveolar affricate with a defective distribution. /c/ has been found only in one lexeme word-initially. It does not occur word-finally and it does not cluster with other consonants. It occurs geminated in intervocalic position in less than 20 lexemes, mainly in verb roots.¹²

cóo	‘down’
geccó	‘old’
wócci	‘difficult’

¹² In the neighbouring Cushitic language Ts’amakko, /cc/ occurs as the geminate counterpart of /ʃ/ as the trace of a historical phonological change: /ʃʃ/ > [cc]. Savà shows that Ts’amakko roots with /cc/ correspond to Dullay cognates containing /ʃ/ (Savà 2005:37-39). The historical link between /cc/ and /ʃ/ can be seen in two Ts’amakko stems: the adjectival root *geecc*- ‘old person’, and the verbal stem *geefuw*- ‘to become old’. It is remarkable that in Hamar the stem *geccó* ‘old person’ is semantically related to *geshó* ‘respected person’, suggesting that a similar historical relation may exist in Hamar, but such relationship cannot be shown synchronically.

The voiceless palato-alveolar affricate is considered mono-segmental since it occurs geminated and word-initially. Its voiced counterpart is also considered mono-segmental since it can occur in any position and it can cluster with other consonants. Consonant clusters, on the contrary can only occur word-internally.

/j/	[ɟ]	voiced palato-alveolar affricate
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/j/ is a voiced palato-alveolar affricate. It does not occur geminated:

jálo	‘bird sp.’
ʔéemajo	‘good spirit’
barjó	‘fate’
c’agáj	‘green’

/k/	[k]	voiceless velar stop	/[_{word} ___ V___a
	[k ^h]	voiceless aspirated velar stop	
	[x]	voiceless velar fricative	

/k/ is a voiceless velar stop.

kerí	‘door’
ḍúka	‘mountain’
bankár	‘arrow’
báski	‘lover’
banák	‘type of timber tree’
líkka	‘small’

Spirantization of /k/ to [x] occurs in the following two words, where /k/ is in intervocalic position, before the low vowel /a/:

saká	‘tomorrow’	[saká] ~ [saxá]
ʔuká	‘pierce’	[ʔuká] ~ [ʔuxá]

Spirantization does not occur in the word *ḍúka* ‘mountain’. For further details see under the velar fricative /x/.

The instrumental case suffix /-ka/ is realized as [-xa] when the preceding segment is a vowel:

ʔaafɔ́-xa	‘with the mouth (M)’	[ʔaaφóxa]
ʔaafón-ka	‘with the mouth (F)’	[ʔaaφónka]

/g/	[g]	voiced velar stop
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/g/ is a voiced velar stop.

gurdá	‘village’
gugána	‘lightning’
bargá	‘millet’
moggó	‘namesake’

Word-finally /g/ occurs only in the numeral *dong* ‘five’. However, this word shows an unusual syllabic structure since consonant clusters never occur word-finally. This is the only example of a CVCC word in Hamar (see 2.3).

/q/	[q]	voiceless uvular stop	/[_{word} ___a /[_{word} ___ ; /___V _{word}] /[_{word} ___o, u
	[q’]	uvular ejective	
	[q ^h]	voiceless uvular aspirated stop	
	[ʔ]	voiceless glottal stop	

/q/ is a voiceless uvular stop. It does not occur geminated.

qáari	‘python’
sháaqa	‘small’
banqí	‘spear’
sílqa	‘knuckle’
panáq	‘frog’

The uvular stop is realized in different ways depending on the environment, on the rate of speech, and on the speaker. Similar to the other voiceless stops, word initially it can be aspirated: the closure is made in the oral cavity between the back of the tongue and the uvula, and the release is accompanied by a light burst of air. Aspiration occurs also before a devoiced final vowel. /q/ is not realized as fricative before the low vowel /a/.

qulí	‘goat’	[q ^h ulí]
máaqa	‘lizard’	[mááq ^h ǎ]

Some Hamar speakers often glottalize /q/ in word initial position before the low vowel /a/. This tendency has been observed especially among speakers exposed to Amharic, such as educated Hamar, and in places where the influence of Amharic is particularly strong, like Dimeka and Turmi. When /q/ is glottalized however, the

place of articulation is still uvular, and not velar.¹³ The glottalization of /q/ is marginal among monolingual Hamar speakers.

qáski	‘dog’	[qáski] ~ [q ^h áski] ~ [q’áski]
qáami	‘ear’	[qáámi] ~ [q ^h áámi] ~ [q’áámi]

In word initial position and followed by back vowels /o/ and /u/, /q/ is optionally realized as glottal stop, a property which it has in common with the dental-alveolar implosive /d/:

qootí	‘beehive’	[qootí] ~ [q ^h ootí] ~ [ʔootí]
quntíni	‘rat’	[quntíni] ~ [q ^h untíni] ~ [ʔuntíni]

/b/	[b̥]	voiced bilabial implosive	
	[b]	voiced bilabial stop	/V__V
	[β]	voiced bilabial fricative	/V__V
	[b̚]	partially released bilabial implosive	/__]_word

/b/ is a voiced bilabial implosive realized with ingressive glottalic airstream.

bénta	‘seed’
gebí	‘many’
karám̩ba	‘calabash for coffee’
ʔatáβ	‘tongue’
toβbá	‘seven’

In fast speech, the bilabial implosive occurring in intervocalic position is often realized as pulmonic [b] or fricativized to [β]:

kuťúβo	‘housefly’	[kuťúβo] ~ [kuťúbo] ~ [kuťúβo]
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Similar to bilabial plosives, the bilabial implosive is partially released word-finally:

ʔatáβ	‘tongue’	[ʔatáβ̚]
gudúb	‘tall’	[gudúb̚]

/d/	[d̥]	voiced dental-alveolar implosive	
	[d]	voiced dental-alveolar stop	/V__V
	[ʔ]	voiceless glottal stop	/V__V; /[_word__u

/d/ is a voiced dental-alveolar implosive realized with ingressive glottalic airstream.

¹³ Hayward (1990) reports a voiceless uvular non-ejective for Aari (to the north), whereas Savà (2005) reports the voiceless uvular ejective in Ts’amakko (to the east).

dánga	‘throat’
ʔáade	‘hippopotamus’
bardá	‘drunk’
kédǎa	‘half’

Word-final /d/ has only been attested in ideophones. Similar to the bilabial implosive /b/, /d/ can be realized as pulmonic in intervocalic position. When /d/ occurs in the accusative marker /-dan/ and is preceded by a vowel, it can be reduced to glottal stop. Reduction to glottal stop has been attested word-initially in one example:

dúka	‘mountain’	[dúka]~[ʔúka]
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Only in one lexeme, /d/ is optionally assimilated to the preceding consonant:

guldánti	‘belly button’	[guldánti]~[gulʔánti]~[gullánti]
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/g/	[g]	voiced velar implosive	/L _{word} —
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/g/ is a voiced velar implosive realized with ingressive glottalic airstream. It is attested only in one verb, and it is in opposition with the voiced velar stop /g/: cf. *giá* ‘tell, say’.

giá	‘hit’
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This verb has a pragmatically marked use: it occurs in a variety of light verb constructions such as *waakí giá* ‘herd the cattle’, literally ‘hit cow’; *juurí giá* ‘churn the butter’, literally ‘hit the butter container’, and so on. The verb *qaná* which also means ‘hit’ is used in other light verb constructions such as *doobí qaná* ‘rain’, literally ‘rain hits’, *núki qaná* ‘sneeze’, *góono qaná* ‘stumble’, and it is used for modern concepts such as *sílki qaná* ‘make a phone call’, *kánki qaná* ‘drive a car’. Both the verbs *giá* and *qaná* have cognates in Aari and Dime: Dime has the verbs *gís’i* ‘hit’ and *k’ané* ‘rain’ (Mulugeta 2008); Aari has the verb *giʔ-* for ‘beat, hit’ and *k’əndə* ‘rain’ (Bender 2003a).

/tʰ/	[tʰ]	dental-alveolar ejective	/___a, i
	[tsʰ]	alveolar ejective affricate	

/tʰ/ is a dental-alveolar ejective produced with egressive glottalic airstream. It is not attested geminated and word-finally:

t’ánzi	‘giraffe’
déet’a	‘heavy’
mart’ó	‘type of necklace’

When followed by the low vowel /a/ or by the high vowel /i/, it can be realized as affricate [ts']:

t'aqalé	'rectum'	[t'aqalé] ~ [ts'aqalé]
t'ía	'black'	[t'ía] ~ [ts'ía]
kat'á	'shoot'	[kat'á] ~ [kats'á]
lant'í	'spleen'	[lant'í] ~ [lants'í]

/c'/	[tʃ]	palato-alveolar ejective affricate	/V__V
	[tʃ]	voiceless palato-alveolar affricate	

/c'/ is a palato-alveolar ejective affricate. It does not occur geminated.

c'ílo	'ant'
dooc'á	'milk container'
qórc'o	'throat'
pac'	'many'

In fast speech /c'/ can be deglottalized when occurring in inter-vocalic position:

pec'é	'beans'	[petʃ'é] ~ [pet'é]
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/s/	[s]	voiceless alveolar fricative
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/s/ is a voiceless alveolar fricative articulated with the blade of the tongue. The tip of the tongue rests against the lower teeth.

seení	'stone'
?ási	'tooth'
zarsí	'type of grass'
meské	'brain'
qáis	'forbidden'
?ossambará	'after two days'

/z/	[z]	voiced alveolar fricative
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/z/ is a voiced laminal alveolar fricative. It does not occur geminated.

zóbo	'lion'
?aizí	'goat hide'
dónza	'elders'
maz	'initiated boy'

/sh/	[ʃ]	voiceless palatal fricative
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/sh/ is a voiceless palato-alveolar fricative.

shaalá	‘ceiling’
búushi	‘chin’
bárshi	‘young’
láshpa	‘shoulder blade’
bish	‘only’
mishshá	‘be full’

/x/	[x]	voiceless velar fricative	/___]word; /V___V
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/x/ is a voiceless velar fricative with a defective distribution. It is found mainly inter-vocalically, it never occurs word-initially, but it is attested word-finally where it contrasts with /k/:

lax	‘six’
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In the words *saká~saxá* and *uká~uxá* the velar stop can be fricativized to /x/. For the words listed below, the realization of /x/ as [k] is deemed incorrect by the speakers:

baxá	‘cook’	[baxá]	*[baká]
taxá	‘cut’		
paxá	‘throw’		
paxála	‘clever’		
daxá	‘tie’		
wɔxá	‘ox’		
woxóno	‘cattle’		

Even if speakers reject the realization of the words listed above with the velar stop [k], the velar stop is the underlying phoneme: the words for ‘ox’ and ‘cattle’ for instance are lexicalized inflected forms related to the general form *waakí* ‘cow’, see chapter 3; the verb *daxá* ‘tie’ is related to the noun *dáki* ‘rope’. The verbs illustrated above, moreover, are reported with the velar stop in Fleming’s wordlist (1986). The postposition /róxa/ ‘through’ and the temporal subordinate marker /-xa/ are always realized with the velar fricative /x/.

/m/	[m]	voiced bilabial nasal	/___]word
	[ṁ]	devoiced bilabial nasal	

/m/ is a voiced bilabial nasal.

máa	‘woman’
lamá	‘two’
qámɓi	‘poor’
sirmá	‘pregnant’
ʔóom [ʔóom]	‘bow’
ɗammá	‘fall’

/n/	[n]	voiced alveolar nasal	/[__] _{word} /[__]k, g
	[ɲ]	devoiced alveolar nasal	
	[ŋ]	voiced velar nasal	

/n/ is a voiced alveolar nasal.

naasí	‘child’
guní	‘snake’
rínso	‘hornet’
kárna	‘belt’
makkán	‘three’
kánno	‘younger sister’

The nasal /n/ is devoiced word-finally:

isín [ʔisín]	‘sorghum’
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[ɲ] occurs only in consonant clusters before velar stops:

nángo	‘soldier ant’
kánki	‘car’

/ɲ/	[ɲ]	voiced palato-alveolar nasal	/[__] _{word} ; V__V
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/ɲ/ is a voiced palato-alveolar nasal. It is not attested word finally and geminated:

ɲámɯɲa	‘ostrich feather’
háɲa	‘fat-tailed sheep’

According to some speakers, word-initial /ɲ/ is interchangeable with /n/ in the Banna variety:

ɲuuri	‘butter container’ [ɲuuri] ~ [nuuri]
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The loanword from Amharic *ferénji* ‘foreigner, white person’ is realized with the palato-alveolar nasal /ɲ/ in Hamar:

paráɲi ‘foreigner’

See the phonological rule P9 in 2.5 for further details.

/l/	[l]	voiced alveolar lateral	/___]_word
	[ɭ]	devoiced alveolar lateral	

/l/ is a voiced alveolar lateral approximant articulated with the tip of the tongue touching the alveolar ridge.

láapa ‘bat’
c’fílo ‘ant’
wárle ‘hare’
wálqanti ‘Aloe sp.’
ḡul [ḡul] ‘waterhole’
qullá ‘goats’

/r/	[r]	voiced alveolar trill	/___]_word
	[ɾ]	devoiced alveolar trill	
	[ɾ]	voiced alveolar tap	

/r/ is a voiced alveolar trill realized with the tip of tongue at the alveolar ridge. Intervocally and in fast speech it can be realized as a tap.

róoto ‘mountain nyala’
qáara ‘vervet monkey’
gurdá ‘village’
déer [déér] ‘red’
wúrro ‘cat’

/w/	[w]	labio-velar approximant
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/w/ is a labio-velar glide produced with rounded lips and the back of the tongue raised towards the soft palate. Similar to the other glides /y/, /ʔ/ and /h/, it does not occur geminated nor word-finally.

waakí ‘cow’
weilám ‘heart’
wíi ‘type of vegetable’
wodímo ‘rich’
wúshki ‘bullet’
ʔáshawá ‘silver-like bracelet’

/y/	[j]	voiced palatal approximant
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/y/ is a voiced palatal glide.

yáati	‘sheep’
yéela	‘roof’
yíti	‘owl’
dǝya	‘bone marrow’
qáyo	‘worm’

/ʔ/	[ʔ]	glottal stop
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/ʔ/ is a glottal stop. It occurs in word initial position, where it contrasts with /h/, and intervocalically. The glottal stop can only function as the onset of a syllable; it does not occur geminated nor word-finally:

ʔéebe	‘cowhide’
daʔíni	‘snake poison’
gaʔásh	‘warthog’

The Amharic loanword [saʔat] ‘hour’ has been borrowed in Hamar as *saʔáti*, thus the glottal stop has been retained.

Words that do not begin with a consonant are analysed as having a glottal stop onset. In fast speech, intervocalic glottal stop can be dropped:

yiʔá	‘go’	[jiʔá] ~ [jiá]
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/h/	[ɦ]	breathy-voiced glottal transition	/[_{word} ___a
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/ɦ/ is a voiced glottal fricative with a highly defective distribution: it occurs in fact only word-initially before the low vowel /a/ and contrasts in the same environment with the glottal stop (cf. 2.1.2). In fast speech [ɦ] is produced with little air.

hámar	‘hamar’
hai	‘sun’
háada	‘rope’
harán	‘type of grass’

The glottal fricative is phonetically realized as breathy phonation on the following low vowel [a̤]. The phonological glottal fricative fills the otherwise unlicensed empty onset of syllables that do not begin with a glottal stop. Other phonemic breathy vowels in Hamar do not exist.

The question of whether setting up a parallel set of breathy vowels has been raised by Hayward for Aari (1990:431-433). In Aari, /h/ is found word-initially (where it contrasts with ʔ) and intervocalically. According to Hayward ‘[...]every word in

which an intervocalic [f] appears, can also be pronounced without such segment. [...] It would appear that h is on the verge of disappearing from the language, though not without leaving a trace of itself in the form of breathy phonation' (1990:431). At the same time, there are cases for which breathy vowels seem '[...]to be independent (in so far as an alternative pronunciation with a distinct [f] segment is not possible)[...]' (ibid.:433). Hayward thus contemplates the option of setting a parallel set of breathy vowels, supported by the fact that h can pair with almost any vowel (except for the back vowel u, ibid.:434, and for long vowels ibid:436). It is interesting to note that intervocalic h in Aari has disappeared in the Hamar cognate word, whereas word-initial h in Aari has some corresponding words in Hamar:

(Aari)	wə́fíá	(Hamar)	wáa	'meat'
(Aari)	ǎ:qe	(Hamar)	háqa	'tree'

2.1.2 Minimal pairs and near minimal pairs

Minimal and near minimal pairs supporting the phonemic status of the consonants are illustrated below. The data show opposition in place and manner of articulation. Pairs show contrast in word-initial, word-medial and word-final position whenever possible. Opposition in place of articulation:

- Voiceless stops /p t c k q/ word-initial

paashá	'recover'
taxá	'cut'
cóo	'down'
kashá	'pay'
qaashá	'collect'

- /p t k q/ word-medial

láapa	'bat'
maatá	'go back'
?aaká	'grandmother'
máaqa	'lizard'
?álpa	'knife'
waltá	'genet'
?álko	'type of agave plant'
ǎalqá	'talk'

- /p t k q/ word-final

galáp	'yellow'
pandát	'gap teeth'
?aarák	'uncle'
zináq	'type of tree'

- Voiced stops /b d j g/ word-initial

bagá	‘tease’
dará	‘lowland’
jagá	‘sparrow’
gará	‘stop’

- /b d j g/ word-medial

náabi	‘name’
wádin	‘differently’
qáji	‘cold’
gáagi	‘mancala game’
shólba	‘light’
qaldó	‘thigh’
barjó	‘fate’
bargá	‘millet’

- Implosives /ɓ ɗ ɠ/ word-initial

ɓagá	‘fall’
ɗaqá	‘avoid’
ɠiá	‘hit’

- /ɓ ɗ/ word-medial

geɓá	‘grow up’
geedá	‘answer’
demɓi	‘death’
?andí	‘type of tree’

- Ejectives /t’ c’/ word-initial

t’íngo	‘honey badger’
c’íilo	‘ant’

- /t’ c’/ word-medial

kat’á	‘shoot’
gaac’á	‘grind’
kúnc’a	‘type of antelope’
qunt’á	‘break’

- Fricatives /s z sh h/ word-initial

síiti	‘hair’
zíiti	‘hook’
shíiti	‘soft’
hámi	‘field’

- /s z sh x/ word-medial

maasá	‘give back’
bazá	‘debit’
mashá	‘slaughter’
baxá	‘cook’

- /s z sh x/ word-final

gas	‘threshold’
baz	‘lake’
gaʔásh	‘warthog’
lax	‘six’

- Nasals /m n ɲ/ word-initial

máati	‘sorghum sprout’
naasí	‘child’
ɲuurí	‘butter container’

- /m n ɲ/ word-medial

kamá	‘pick up’
qána	‘stream’
qáɲa	‘vagina’

- /m n/ word-final

háam	‘jugular vein’
ʔáan	‘arm’

- Liquids /l r/ word-initial

lant’í	‘spleen’
ráat’i	‘milk’

- /l r/ word-medial

túla	‘small pond’
túra	‘up’

- /l r/ word-final

gul	‘corner of the house’
gur	‘ring’

- Glides /w y/ word initial

wáa	‘meat’
yáa	‘you’
wíi	‘vegetable’

ʔíi	‘stomach’
yedá	‘keep’
ʔedá	‘separate’

- /w y ʔ/ word-medial

ʔáshawá	‘silver-like bracelet’
nagáya	‘peace’
gaʔásh	‘warthog’

Opposition in manner of articulation:

- Bilabials /p b ɓ m w/ word-initial

paashá	‘recover’
bashá	‘win’
ɓaashá	‘comb’
maashá	‘slaughter’
wushá	‘make drink’

- /p b ɓ m w/ word-medial

láapa	‘bat’
labalé	‘ostrich’
laɓá	‘square shape’
lamá	‘two’
ʔɔrawal	‘backwards, towards the speaker’

- Alveolars /t d ɗ tʰ s z n l r/ word-initial

tipá	‘honest’
diibá	‘steal’
ɗíta	‘type of tree’
tʰipá	‘darkness’
sirmá	‘pregnant’
zigá	‘shake’
niʔá	‘come’
líkka	‘little’
riggíma	‘chew stick’

- /t d ɗ tʰ s z n l r/ word-medial

raatá	‘sleep’
ʔadá	‘shave’
ʔaadá	‘give birth’
dáat’a	‘sweet’
ɗaasá	‘lift up’

gazá	‘generous’
kána	‘younger sibling’
galá	‘food’
gará	‘stop’

- Palato-alveolars /c j c’ sh ɲ y/ word-initial

cóo	‘down’
jaagá	‘sew’
c’aaná	‘load’
shaná	‘buy’
ɲámujna	‘ostrich feather’
yaaná	‘sheep’

- /j c’ sh ɲ y/ word-medial

barjó	‘fate’
wánc’o	‘milky way’
ʔásho	‘slope’
yáayo	‘wild hunting dog’
ɲáboqo	‘type of anklet’

- /j c’ sh/ word-final

shamáj	‘albino cattle coat colour’
pac’	‘many’
tánqash	‘antelope’

- Velars and uvular/k g ɣ q/ word-initial

kaá	‘pour’
giá	‘tell’
ɣiá	‘hit’
qaďá	‘wear’
kansá	‘fight’
gansá	‘sniff’
qansá	‘listen’

- /k g x q/ word-medial

púka	‘caracal’
pugá	‘blow’
ʔuká	‘pierce’
duuqá	‘sow’
ďóngo	‘bell’
ďónko	‘speech’
ʔonqó	‘type of bean’

- /k x q/ word-final

gerák	‘beam’
lax	‘six’
panáq	‘frog’

- Glottals /ʔ h/ word-initial

ʔáino	‘goat hide’
háino	‘sun’
ʔamḃá	‘dream’
hamḃá	‘be told’
ʔáka	‘large intestine’ ¹⁴
háqa	‘tree’
ʔáaḃe	‘hippopotamus’
háade	‘razor’
ʔáan	‘arm’
háan	‘you’ (2SG:ACC)
ʔátti	‘bird’
hátti	‘how’

- Glottals and uvular /ʔ h q/ word-initial

hámi	‘field’
ʔamí	‘breast’
qáami	‘ear’

- Glottal and glide /ʔ w/ word-initial

ʔoisá	‘ask’
woisá	‘put down’
ʔúkumḃa	‘thorn’
wúkumḃa	‘bark’

- Glottal and glide /ʔ y/ word-initial

ʔíir	‘inside’
yíir	‘upper arm’

- Glottal and long vowels word-medial

kaá	‘pour’
gaʔá	‘bite’
baʔá	‘bring’
ḃáa	‘up’

¹⁴ ʔáka is in opposition with ʔaaká ‘grandmother’, thus long /a/ is not necessarily breathy.

2.1.3 Consonant gemination

Gemination is only found word-internally. It occurs in lexical roots but it mainly arises grammatically. Geminated consonants are phonetically longer than average, and they have to be considered as ambisyllabic segments filling the coda of a preceding syllable and the onset of the following syllable. Over 24 consonant phonemes, 14 have been attested geminated (/p/, /b/, /t/, /d/, /c/, /k/, /g/, /b/, /d/, /s/, /sh/, /n/, /m/, /l/); the gaps are partly accidental: word-final sonorant segments become geminates with feminine and plural inflections (see below), whereas other segments undergo metathesis and other phonological processes, see 2.5.

Below I contrast some minimal pairs containing geminate and non-geminate consonants.

kótte	‘shirt’
kóte	‘here’
ʔóito	‘female name’
ʔóitto	‘the fourth’
kummá	‘eat’
kumá	‘drink (milk)’
hammó	‘which’
hamó	‘where’
ʔonnó	‘house’
ʔóono	‘heifer’
happá	‘make braids’
ʔapá	‘unfold’
balé	‘male name’
ballé	‘female name’
ʔalá	‘guard’
ʔállá	‘traditional beer mixed with honey’

Grammatically, gemination arises after suffixation of the feminine and the plural inflections /-no/ and /-na/ to nominal roots ending in a sonorant segment. When the sonorant is a liquid or bilabial nasal, the nasal of the inflection assimilates to the preceding consonant (see 2.5 for further details).

kerí	‘door’
kerró	‘door:F.S’
kerrá	‘doors:PL’
hámi	‘field’
hámmo	‘field:F.S’
hámma	‘fields:PL’
?apála	‘blanket’
?apálla	‘blanket:F.S’
?apálla	‘blankets:PL’

Passive and causative derivations as well give rise to geminated consonant:

?aðá	‘give birth’
?aðdá	‘be born’
raatá	‘sleep’
rattá	‘put to sleep’

2.2 Vowels

Hamar has seven vowel qualities and five diphthongs. Vowel quantity is contrastive. Vowel length is indicated by doubling the vowel symbol.

Table 2.2: Vowel phonemes

	Front	Central	Back
High	i ii		u uu
Mid High	e ee		o oo
Mid Low	ɛ ɛɛ		ɔ ɔɔ
Low		a aa	

As will be discussed in 2.2.2, the mid-low vowels /ɛ/ and /ɔ/ are in complementary distribution with the mid-high vowels /e/ and /o/ in the lexicon: when mid-high vowels occur in stressed syllable and are followed by the low vowel /a/ they are realized as mid-low (with a few exceptions). Mid-low vowels however arise out of coalescence (phonological rule P5) and masculine mid-vowel lowering (morpho-phonological rule MP5), thus they have a high functional load. Changes in the quality of stem vowels are one aspect of morpheme realization: for this reason the mid-low vowels are considered phonemic. The morpho-phonological rule MP5 is described in detail in 2.5, and section 2.6 analyses the co-occurrence of MP5, P5 and prosody in masculine inflected nouns. Vowel realization is influenced by stress and it will be discussed in detail in 2.2.2. Vowel length is treated in 2.2.3.

2.2.1 Description of vowel phonemes and distribution

All vowel phonemes occur word-internally and word-finally after any consonant, except for the glottal fricative /h/ which can only pair with the low vowel /a/. The phonetic realization of vowels approximates cardinal vowels. The vowels /u o ɔ/ are always audibly rounded. /a/ is a low central unrounded vowel. Quality oppositions are illustrated below:

/i e/

walí	‘sickle’	walé	‘dove’
zíiga	‘spinal cord’	zéega	‘bird of prey sp.’
shidá	‘stay’	shedá	‘look’
píi	‘human faeces’	pée	‘land’

/e a/

bénzo	‘clapper of a bell’	bánzo	‘please’
leʔé	‘year’	laʔá	‘lick’
déer	‘red’	dáar	‘cattle’s field’
bóte	‘pumpkin’	bóta	‘space, room’

/i a/

kílanqi	‘snake eagle’	kalánqi	‘moringa tree’
máati	‘fermented grains’	maatá	‘come back’
mishá	‘older sister’	mashá	‘slaughter’

/u o/

ʔurró	‘war’	ʔorra	‘from over there’
burqá	‘be hot’	dorqá	‘sit’
gur	‘support for calabash’	gor	‘type of ritual’
kut’ó	‘vulture’	kot’ó	‘female name’

/o a/

zíigo	‘sorghum crumble’	zíiga	‘spinal cord’
dottá	‘put down’	dattá	‘wild animal’ (M)
ʔogó	‘that’ (F)	ʔagá	‘that’ (M)

/u a/

dumá	‘grab’	damá	‘be able’
gúuri	‘empty’	gaarí	‘big’
núu	‘fire’	náa	‘yesterday’

/i u/

gíní	‘vein’	guní	‘snake’
ʔirá	‘curse’	ʔurá	‘gale’
míri	‘river waves’	murá	‘gun’

/e o/

wuc’é	‘drink!’ (IMP.2PL)	wuc’ó	‘in order to drink’
zeelí	‘boma’	zoolí	‘shin’
dettá	‘make kill’	dottá	‘put down’

/i o/

kidí	‘he/they’	kodí	‘she’
míri	‘river waves’	móro	‘lard, fat’
ʔíi	‘stomach’	ʔóo	‘over there’

/e u/

kerí	‘door’	kurí	‘honey’
lemá	‘slow down’	lumá	‘feel unwell’
deesá	‘kill’	duusá	‘get used to’

The vowels /a e i o/ occur as terminal vowels in nouns. The infinitive of verbs, used as the citation form, ends in /-á/. The back vowel /u/ is found word-finally in monosyllabic nouns, as the second segment of the diphthong /au/: there are no words like *CVCu in Hamar. The back vowel /u/ has distributional restrictions: it can co-occur at the left of any vowel, but not in the syllable following the vowels /e i o/. The following table shows vowel co-occurrence in lexical items. The vowels in the first column on the left occur before the vowels in the top row.

Table 2.3: Vowel co-occurrence

	a	e	i	o	u
a	galá	qálbe	qáski	nángo	gámuri
e	berá	meté	kerí	geccó	
i	tíma	tigé	c’íshi	rínso	
o	dongár	kóte	wotí	noqó	
u	túla	búme	kurí	pusó	gutúm

The interrogative copula in Hamar is the morpheme /-u/, which can be suffixed to both nominal and verbal elements. In this context there are no restrictions and the vowel /u/ is found after any vowel:

hámar	‘Hamar’	hámar-u	‘(is he/she) Hamar?’
déer	‘red’	déer-u	‘(is it) red?’
yéela	‘roof’	yéela-u	‘(is it a) roof?’

?imidí	‘has given’	?imid-ú	‘have (you) given?’
báasha	‘chicken’	báasha-u	‘(is it a) chicken?’
seelé	‘guineafowl’	seelé-u	‘(is it a) guineafowl?’
c’íshi	‘bile’	c’íshi-u	‘(is it) bile?’
bóoko	‘club stick’	bóoko-u	‘(is it a) club stick?’

Moreover, the interrogative copula /-u/ suffixed to verb stems contrasts with the future interrogative marker /-o/:

?ashká-u	‘shall I make?’	?í=da ?ashkó	‘do I make?’
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2.2.2 Vowel realization

Word-final unstressed vowels can be devoiced or partially devoiced especially in utterance-final position.¹⁵

háada	‘rope’	[hááda] ~ [hááda]
róqo	‘tamarind tree’	[róq ^h o] ~ [róqo]
?éébe	‘cowhide’	[?éébe] ~ [?éébe]

Word-final stressed vowels, when words are uttered in isolation or precede a pause, can be phonetically breathy:¹⁶

meté	‘head’	[meté] ~ [meté ^h]
muná	‘sorghum dumpling’	[muná] ~ [muná ^h]
demí	‘side’	[demí] ~ [demí ^h]
indá	‘mother’	[indá] ~ [indá ^h]

This applies also to phonetically long vowels in final position, see examples in 2.4.1. In allegro speech, word-medial unstressed short vowels can be centralized:

kirá	‘these’ (DEM1.PL)	[kirá] ~ [kirá] ~ [kərá]
beré	‘later’	[beré] ~ [bərəé]
?ékeri	‘bed bug’	[?ékeri] ~ [?ékəri]
jagá	‘sparrow’	[ɕagá] ~ [ɕəgá]

¹⁵ Devoicing of short final vowels is reported also in Oromo (Stroomeer 1995:15); (Bender et al. 1976:132). Turkana has final devoiced vowels, but their occurrence is not predictable by the position of stress or tone (Dimmendaal 1983:31).

¹⁶ Similar to Hamar, Boraana final long vowels can be realized as a short vowel plus [h] plus voiceless vowel: [V^hɥ] (Stroomeer 1995:16). In Turkana breathy phonation is an articulatory correlate of [+ATR] vowels (Dimmendaal 1983:27-29).

Stressed mid-high vowels are lowered to /ɛ/ and /ɔ/ when followed by the low vowel /a/. Unstressed mid-high vowels are not affected. The realization of stressed mid-high vowels is shown in the examples below:

ʔéna	‘past’	[ʔéna]
yéɛla	‘roof’	[jéɛla]
déɛga	‘dumb’	[déɛga]
kédɔ́da	‘half’	[kédɔ́da]
ʔéemajo	‘good spirit’	[ʔéémaɕo]
gédaqa	‘tree sp.’	[gédaqa]
gélaba	‘Dhaasanac’	[gélaba]
pélan pélo	‘butterfly’	[pélan pélo]
bénta	‘seed’	[bénta]
ʔóra	‘towards the speaker’	[ʔóra]
qóɕt’a	‘nape’	[qóɕt]’a]
dónza	‘elder’	[dónza]
bóna	‘drought’	[bóna]
bóta	‘room, space’ (Amh.)	[bóta]
bólta	‘fermented milk’	[bólta]
dóya	‘bone marrow’	[dója]
qólma	‘without’	[qólma]
shólba	‘light’	[ʃólba]
róxa	‘through’	[róxa]

Pronouncing the words given above with the corresponding mid-high vowels is not considered incorrect by the speakers.

Apart from few exceptions, unstressed mid-high vowels are not affected by the low vowel /a/:

berá	‘in front of’	[berá]
booc’á	‘milk container’	[boot]’á]
shodár	‘bird sp.’	[ʃodár]
dongár	‘elephant’	[dɔŋgár]
deeshá	‘medicine’	[dee]há]
desá	‘know’	[desá]
doyá	‘show’	[dojá]
doolá	‘milk churn’	[doolá]
woomá	‘honey container’	[woomá]
gerák	‘beam’	[gerák]
gobá	‘run’	[gobá]
qoc’á	‘suck’	[qot]’á]
keerá	‘cactus’	[keerá]

In some lexical items, the mid-low vowels /ɛ/ and /ɔ/ are in free variation with the mid-high vowels /e/ and /o/ also when unstressed: the quality of the vowels in the following examples can vary within the same speaker's utterances and none of the two pronunciations is preferred over the other.

deesá	'kill'	[deesá] ~ [dɛɛsá]
déet'a	'heavy'	[déét'a] ~ [dɛét'a]
?eedá	'relative'	[?eedá] ~ [?ɛɛdá]
kéda	'then'	[kéda] ~ [kɛda]
?óida	'hot'	[?óida] ~ [?óida]
qolbá	'fetch water'	[qolbá] ~ [qɔlbá]
?oshála	'after two days'	[?oʃála] ~ [ʔɔʃála]
wólsha	'sorghum sugar cane'	[wólʃa] ~ [wɔlʃa]

On the contrary, for the few words illustrated below, the pronunciation given in brackets is the only one that has been recorded.

?ɛdá	'luck'	[?ɛdá]
cóobar	'down there'	[tʃóóbar]
córra	'from below'	[tʃórra]
?óobar	'up there'	[?óóbar]
?órra	'from there'	[?órra] ¹⁷
zéega	'bird of prey sp.'	[zééga]
sɛl	'nine'	[sɛl] ~ [sal]
mɛɛ	'downwards'	[mɛɛ] ¹⁸

These exceptions can give rise to few minimal pairs such as *ɛdá* 'luck' vs. *edá* 'separate'. As will be illustrated later on, mid-low vowels can arise as the result of phonological and morpho-phonological processes in nouns inflected for masculine gender. Substituting a mid-high vowel for a mid-low vowel in a masculine inflected noun is considered ungrammatical. Lowering of mid vowels in the lexicon is pretty close to metaphony, a type of height vowel harmony which targets only stressed vowels. However, in this assimilatory process, change in the height of a stressed vowel is generally triggered by a suffix vowel. In the case of Hamar, the post-tonic low vowel /a/ occurring in nouns cannot be considered, at least synchronically, a suffix. In most cases it is part of the nominal root to which gender and number inflections are suffixed:

¹⁷ The words *cóobar*, *córra*, *?óobar* and *?órra* are composed of the deictics *cóo* and *óo* plus the case suffixes *-bar* and *-rra*, see chapter 5.

¹⁸ In Boraana the question word *mɛɛ* 'where?' borrowed from Somali is also realized with the mid-low vowel *ɛ*. In this respect Stroemer (1995:16) states that '[...] it is not clear whether [ɛɛ] is an allophone of *ee* [...]'].

yéela	‘roof’	yéela-na	‘roof-PL’
yéela-no	‘roof-F.S’	yeełâ	‘roof:M’

Moreover, the low vowel /a/ may trigger lowering of mid-high vowels also when it occurs inside the root, as in *pélan pélo* ‘butterfly’, and in words such as *íra* ‘towards the speaker’. In the case of verbs, mid-high stem vowels are usually not lowered since the citation form of verbs always ends in /-á/ (see 2.4.2), however some variation may occur among different speakers, see the examples for *deesá* ‘kill’ and *qolbá* ‘fetch water’ given above.

gobá	‘run’
desá	‘know’

Lowering of stressed mid-high vowels (and unstressed mid-high vowels in the exceptional cases illustrated above) in nouns, verbs and connective words seems to emerge out of analogy with the nominal inflectional system, where the masculine mid-vowel lowering (morpho-phonological rule MP5) and vowel coalescence (phonological rule P5) occur systematically. MP5 and P5 however target both stressed and unstressed vowels causing various vowel mutations, see 2.5 and 2.6 for further details.

2.2.3 Vowel length

Vowel quantity is distinctive. Long vowels are restricted to the first syllable of a word. The examples below show the quantity oppositions:

/a/ /aa/

c’ác’i	‘sky’	c’aac’í	‘root’
?ashá	‘insult’	?aashá	‘hide’

/e/ /ee/

?éna	‘past’	?éena	‘people’
gedé	‘bed’	geedé	‘answer!’ (IMP.2PL)

/i/ /ii/

shidá	‘stay’	shiidá	‘be washed’
zigá	‘shake’	zíiga	‘spinal cord’

/o/ /oo/

gobá	‘run’	goobá	‘decorate’
qot’í	‘shaved area’	qootí	‘beehive’

/u/ /uu/

c'úba	'smoke'	c'uubá	'wash the clothes'
shupí	'lid'	shúupi	'sunflower'

Phonemically long vowels are phonetically long: they are longer than short vowels in stressed syllables. The examples below show vowel length (in seconds) in the first syllable (abbreviated VL1). The unstressed long vowel in *goobá* is longer than the stressed short vowel in *góro*.

góro	'Colobus monkey'	VL1 = 0.091
gobá	'run'	VL1 = 0.070
góodo	'termite eater'	VL1 = 0.151
goobá	'decorate'	VL1 = 0.130

Long vowels can be phonetically shortened when nominal or verbal stems are extended through inflection and/or derivation. CVVC syllables are allowed only in monosyllables (see 2.3). Vowel shortening occurs to avoid $C_1VVC_2.C_2V$ and $C_1VVC_2.C_3V$ structures. The context for vowel shortening is found often after suffixation of the feminine and plural markers /-no/ and /-na/, after suffixation of the masculine suffix /-tâ/, with verbal derivations and in concomitance with the ablative case /-rra/. Even though vowels undergoing shortening are not phonetically short as short vowels in word-medial position, they are shorter than the related long vowels in the general form. Forms in brackets represent unattested stages, see 2.5 for the underlying phonological rules.

qáami	'ear'	(qaam-no)	> qámno
?ooní	'house'	(?oon-no)	> ?onnó
?áan	'arm'	(?aan-ta)	> ?antâ
yíir	'upper arm'	(yiir-na)	> yírna
káara	'fish'	(kaar-ta)	> kartâ
jaagá	'sew'	(jaag-s-á)	> jashká
shooshí	'guest'	(shoosh-na)	> shoná
?óo	'over there'	(?oo-rra)	> ?órna

2.2.4 Diphthongs

Diphthongs occur in the lexicon in word-medial and word-final position, and arise grammatically. There are four closing diphthongs (/ai/, /au/, /ei/, /oi/), and one opening diphthong (/ia/).

/ai/ word-medial and word-final:

?áigi	'fence'	baití	'river'
lánkai	'eight'	dúmai	'thumb'

/ia/ word-final:

sía	‘bad’	zía	‘brave’
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/au/ word-medial and word-final:

c’aulí	‘white’	gáu	‘bracelet’
sautí	‘Acacia tree’	qáu	‘forest’

/ei/ word-medial:

weilám	‘heart’	?eiké	‘grandfather’
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/oi/ word-medial:

goití	‘pathway’	?óiso	‘question’
--------------	-----------	--------------	------------

As shown in 2.2.1, diphthongs arise grammatically when the interrogative copula /-u/ is suffixed to vowel ending nominal or verbal stems:

payá	‘good’	payáu	‘Is it good?’
wuc’á	‘drink’	wuc’áu	‘Shall I drink?’

2.3 Word structure

Onsetless syllables, onsets with consonant clusters and codas with consonant clusters are not permitted in Hamar. Syllable boundaries are indicated by a full stop.

2.3.1 Syllable

Hamar has four possible phonemic syllable types:

CV	qu.lí	‘goat’
CVV	káa.ra	‘fish’
CVC	kár.c’a	‘cheek’
CVVC	déer	‘red’

The minimal syllable type is CV. The nucleus of a syllable is either a short or a long vowel. CVVC syllables occur only in monosyllables. Derived nouns with a syllabic structure of the type CVVC.CV undergo vowel shortening and surface as CVC.CV as shown in 2.2.3. All consonants and glides can be the onset of a syllable. The onset and the coda of a syllable cannot contain more than one consonantal segment. For this reason consonant clusters only occur word-internally at syllable boundaries and geminate consonants are ambisyllabic segments filling the coda of a syllable and the onset of the following syllable:

?át.ti ‘bird’

Hamar shows a striking preference for sonorants in coda position. Obstruent segments in codas are extremely rare and are found only in monosyllables and word-final syllables. If consonant clusters arise where an obstruent occurs as the first segment of the cluster, morpho-phonological rules apply in order to avoid the illicit sequence (see metathesis and assimilation rules in 2.5).

Although consonant clusters are not allowed in codas, there is one exception: the numeral word *dong* ‘five’. /n.g/ is a licensed sequence in word-medial position, however there are no other Hamar words ending with a consonant cluster.

2.3.2 Consonant clusters

Consonant clustering is constrained as follows:

The first segment of a cluster is preferably a sonorant (nasal or liquid), or a fricative (the alveolar and post-alveolar /s//sh/); consonant clusters starting with stops, implosives and ejectives are not licensed. Metathesis occurs to avoid illicit sequences when they arise grammatically (see 2.5, phonological rule P2).

Nasal + obstruent clusters:

m.p	sómpo	‘lung’
m.b	dámbi	‘tradition’
m.ɓ	demɓí	‘death’
n.t	kánta	‘strength’
n.d	ʔindá	‘mother’
n.ɗ	tuqáɗa	‘hiccup’
n.tʼ	lantʼí	‘spleen’
n.s	qansá	‘listen’
n.z	ʔanzá	‘girl’
n.cʼ	gancʼá	‘thin’
n.sh	ʔanshá	‘descend’
n.k	kínka	‘together’
n.g	ɗánga	‘throat’
n.q	sunqá	‘kiss’

Liquid + obstruent clusters:

r.p	ʔárpi	‘moon’
r.m	sirmá	‘pregnant’
r.t	gertámo	‘clan’
r.d	ʔardá	‘enter’
r.ɗ	bardá	‘drunk’
r.tʼ	mártʼo	‘type of necklace’
r.s	parsí	‘ale-gruel beer’
r.l	bórle	‘young person’
r.j	mirjá	‘kudu’

r.c'	qarc'á	'grass' seed'
r.sh	marshá	'rituals'
r.k	túrke	'dust'
r.g	bárgi	'dry season'
r.q	dorqá	'sit'
l.p	?álpa	'knife'
l.b	silbí	'dark brown' (cattle coat colour)
l.ḡ	qolḡá	'fetch water'
l.m	?álma	'female name'
l.t	qultá	'male goat'
l.d	qaldó	'thigh'
l.d'	?eldá	'be called'
l.t'	galt'á	'seal with mud'
l.s	bulsá	'send out'
l.sh	galshá	'annoy'
l.k	?álko	' <i>Sansevieria</i> plant sp.'
l.g	gilgishá	'tickle'
l.q	ḡalqá	'speak'

Fricatives /s sh/ + obstruent clusters:

s.k	baská	'bring'
s.g	gasgó	'wheat'
sh.p	goshpá	'respect'
sh.k	?ashká	'do'

2.3.3 Syllable patterns in nouns and verbs

The preferred structure for nouns in Hamar is disyllabic. Trisyllabic and monosyllabic nouns occur but are rare. The canonical syllabic structure is CV.CV, CVC.CV, CVV.CV for disyllabic nouns and CV.CV.CV, CV.CVC.CV, CVC.CV.CV for trisyllabic nouns.

CV	wa	'another'
CVV	dáa	'clay pot'
CVC	ḡul	'waterhole'
CVVC	dáar	'cattle's field'
CV.CV	no.qó	'water'
CVV.CV	qáa.mi	'ear'
CVC.CV	gír.sho	'porcupine'
CVC.CVC	don.gár	'elephant'
CV.CVC	sho.dár	'bird sp.'
CV.CV.CV	se.ge.ré	'dik-dik'
CVC.CV.CV	kor.qi.shá	'francolin, bird sp.'

CV.CVC.CV	ka.rám.ḡa	‘calabash for coffee’
CVC.CVC.CV	wál.qan.ti ¹⁹	‘Aloe vera’

Verbs are generally disyllabic; monosyllabic and trisyllabic stems are uncommon. Longer stems are extended through derivational suffixes. Verbs in the citation form carry a high tone on the last vowel (see 2.4.2):

CVV	kaá	‘pour’
CV.CV	ḡulá	‘jump’
CVV.CV	raatá	‘sleep’
CVC.CV	ḡalqá	‘speak’

2.4 Word prosody

There are no accentless words in Hamar, and there is only one prominent syllable per word, cued by high pitch, loudness and increased duration. In this section the acoustic features and the functions of prominence are described, showing that Hamar has two co-existing, yet independent systems which can be analysed in terms of stress and tone. Stress is indicated with the diacritic /**́**/, and a circumflex accent /**ˆ**/ indicates falling tone. CV and CVC word types have no diacritics.

2.4.1 Stress

The phonetic cues of stress are increased duration (as shown in section 2.2.3, where the length of short unstressed vowels and short stressed vowels is compared), loudness and high pitch. In nouns, long vowels and diphthongs in word internal position and in monosyllabic words carry only one and the same pitch:

zíini	[ʼ zíini]	‘mosquito’	*[zĩini] *[ziĩini]
déer	[ʼ déer]	‘red’	
dáa	[ʼ dáa]	‘clay pot’	
qáu	[ʼ qáu]	‘bushy area’	
sía	[ʼ sía]	‘bad’	

In nouns there is only one stressed syllable and ***σ.σ** or ***ó.ó** word types are not attested:

ó.σ	qá.sa	‘louse’
σ.ó	me.té	‘head’

¹⁹ Plant’s names are usually trisyllabic. The following is a list of nouns referring to plants and trees, but not all of them have been classified yet, cf. the lexicon at the end of the book: *pulánti*, *ruc’ánti*, *kalánqi*, *gáranti*, *shámbulo*, *zínzaqe*, *tubáqe*, *óndoko*, *baráza*, *gédaga*.

Stress in nouns is lexical and its position is not predictable. In disyllabic nouns, either the final or the penultimate syllable can be stressed. In disyllabic nouns composed of a heavy syllable, stress is attested in any position:

shaa.lá	‘ceiling’
zíi.ga	‘spinal cord’
síl.qa	‘knuckle’
gur.dá	‘village’

Stress in nouns can be lexically distinctive. A few óσ vs. óó minimal pairs occurring in the same grammatical domain have been attested:

hámmo	‘field:F.S’	hammó	‘which:F.S’
hámma	‘field:PL’	hammá	‘which:PL’
átti	‘bird’	attí	‘fermented sorghum’
?ásho	‘slope’	?ashó	‘type of tree’

The possessed form of the kinship terms (cf. chapter 8) for ‘mother’ and ‘father’ contrast with the general form in the position of pitch:

indá	‘mother’	índa	‘my mother’
imbá	‘father/owner’	ímba	‘my father’

Trisyllabic nouns can have a final, penultimate or antepenultimate stressed syllable as displayed in the CV.CV.CV minimal pairs below.

ánqasi	‘bee’	anqási	‘lamb’
shékini	‘white quartz’	shekíni	‘beads’
bagáde	‘backbone’	bagadé	‘cooked blood’

Suffixation of feminine (-no) and plural (-na) inflections to nominal roots does not change the position of pitch:

shaalá	‘ceiling’	shaaláno	shaalána
meté	‘head’	meténo	meténa
zikí	‘goat faeces’	zikíno	zikína
qólpo	‘scorpion’	qólpono	qólpona

Stress plays an important role in the nominal morphology, especially as far as masculine nouns are concerned. Nouns inflected for masculine gender get a final stress which is realized as falling tone:

qása	‘louse’	qasâ	‘louse:M’
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The masculine suffixes /-â/ and /-tâ/ trigger various (morpho)-phonological changes (see 2.5 and 2.6 for further details) on inflected nouns. For instance the masculine inflection /-â/ in the following example is realized with a final falling tone and with coalescence of the final vowel /o/ with the masculine inflection /-â/. Moreover, the masculine inflection lowers the root vowels:

róqo	‘tamarind tree’	rɔqô	‘tamarind tree:M’
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In nouns where vowel mutation is not observable, the difference between the uninflected form and the masculine inflected form is only prosodic: prominence usually switches to the final syllable and it is realized as falling tone.

hápa	‘sheep’	[‘hápa]
hapâ	‘sheep:M’	[hà‘pâ]

In the previous example the final vowel /a/ of the general form is devoiced because unstressed (cf. 2.2.2).

When nouns are uttered in isolation or before a pause, the final stressed syllable of the masculine form can be phonetically long. Length and falling tone however are hardly ever realized in connected speech, especially before case suffixes. When a noun like *hápa* above is inflected for masculine gender, the final stress can be thus realized with a final high tone, rather than a falling tone: [ha‘pá].

Some uninflected nouns have stress on the final syllable:

zará	‘body’
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In such cases the difference between the uninflected form *zará* and the masculine form *zarâ* can be noticed only in isolation or before a pause: the final vowel is realized longer and/or carrying a falling tone. Below I compare stress final uninflected forms²⁰ and their related masculine inflected form. The examples are all uttered in isolation. VL2 indicates the length (in seconds) of the final vowel:

jagá	‘sparrow’	VL2 = 0.080
jagâ (M)	[dʒà‘gâà ^h] ²¹	VL2 = 0.144
muná	‘dumplings’	VL2 = 0.068
munâ (M)	[mù‘náà]	VL2 = 0.141

²⁰ These words are examples of nouns which are neutral to the vowel mutation triggered by coalescence (P5) and masculine mid-vowel lowering (MP5).

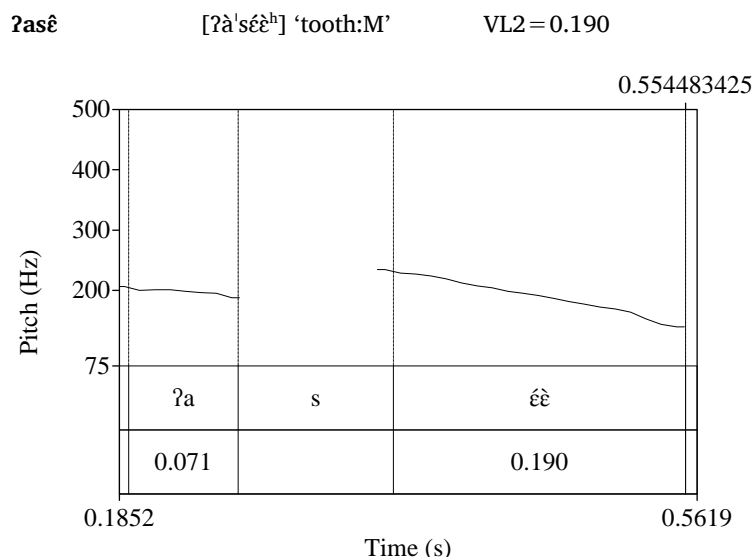
²¹ Note that final stressed vowels can be breathy, cf. 2.2.2. In all the examples the final vowel can be breathy or not.

shaalá		‘ceiling’	VL2 = 0.067
shaalá	(M)	[ʃàà'láà]	VL2 = 0.140
ganc'á		‘thin’	VL2 = 0.090
ganc'á	(M)	[gàn'tʃ'áà]	VL2 = 0.154

For such nouns, the difference between the uninflected form and the inflected masculine form cannot always be detected on the basis of phonological criteria because the distinction is lost in connected speech. The masculine form however can be distinguished from the uninflected form on the basis of syntactic, discourse-related and semantic properties. Uninflected forms are distributionally restricted and cannot occur in contexts where syntactic agreement is required; their meaning is general, undetermined and neutral about gender and number, see chapter 3 for further details.

The PRAAT diagrams below show the difference in length and pitch contour between masculine nouns uttered in isolation and in context.

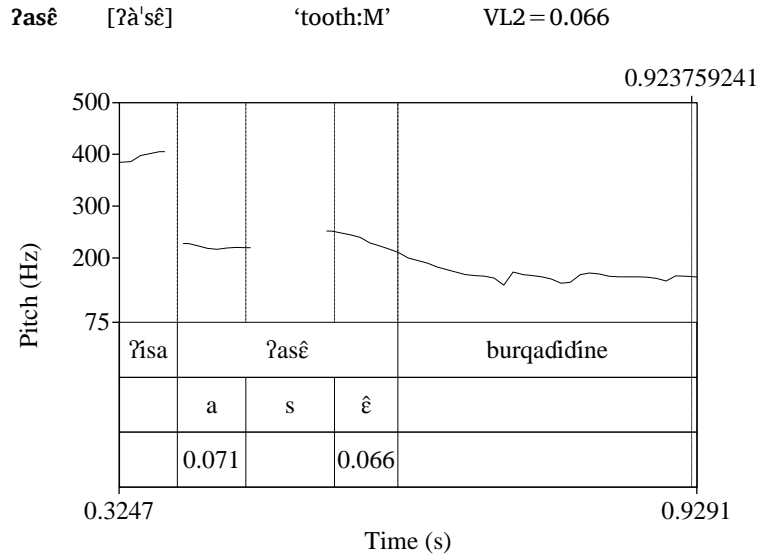
The first diagram displays the noun *ʔási* ‘tooth’ inflected for masculine gender and uttered in isolation. The final vowel of *ʔási* merges with the masculine suffix */-â/* resulting in the mid-low */ɛ/* (phonological rule P5, cf. section 2.5). The final vowel of *ʔasê* is quite long (0.190 seconds) and carries a falling pitch:



The second diagram shows the same inflected masculine noun *ʔasê* uttered in connected speech:

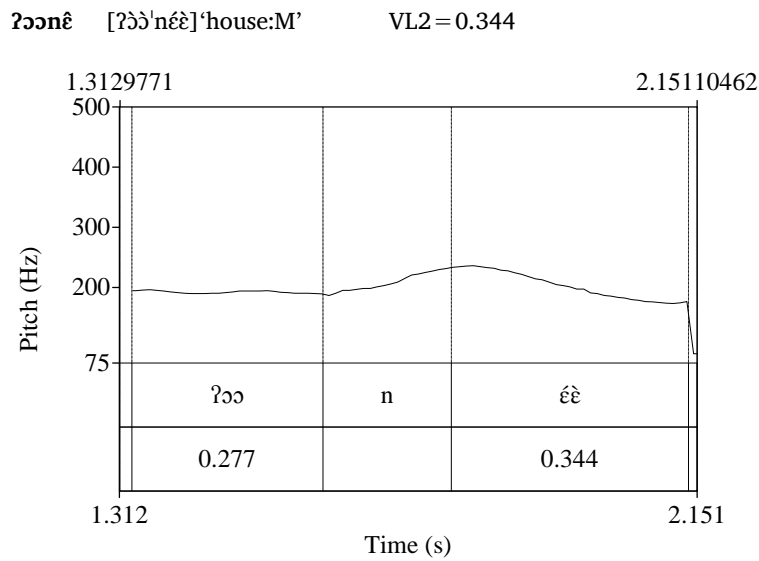
- (1) *ʔí* = **sa** *ʔasê* **burqad-idí-ne**
 1SG = GEN tooth:M hurt-PF-COP
 lit.: my tooth (M) hurts

The final vowel of *ʔasê* is drastically shorter in connected speech, as it can be seen in the next diagram representing sentence (1):



In the previous diagram, the falling pitch on the final short vowel of *ʔasê* is still visible.

Next example shows the inflected masculine form of *ʔooní* 'house' in isolation. As for the noun *ʔási*, coalescence occurs between the final vowel /i/ of *ʔooní* and the masculine inflection /-â/. In isolation, the final vowel is exceptionally long:

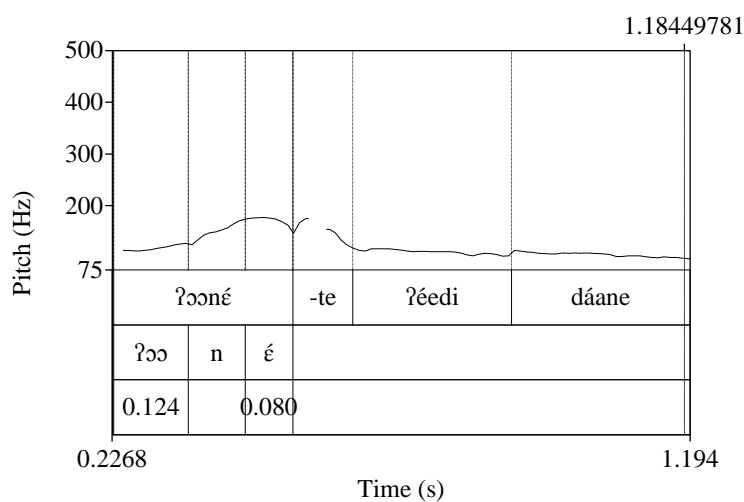


The following examples show the masculine inflected noun *ḥanē* followed by the locative and allative suffix cases. In such cases, not only is the final long vowel shortened, but there is no clear fall on the final vowel.

- (2) ʔɔɔné-te ʔéedi dáa-ne
house:M-LOC person exist-COP
somebody is in the house (M)

In sentence (2), which is represented in the next diagram, the final vowel is only 0.080 seconds long, against the 0.344 seconds of the same noun uttered in isolation:

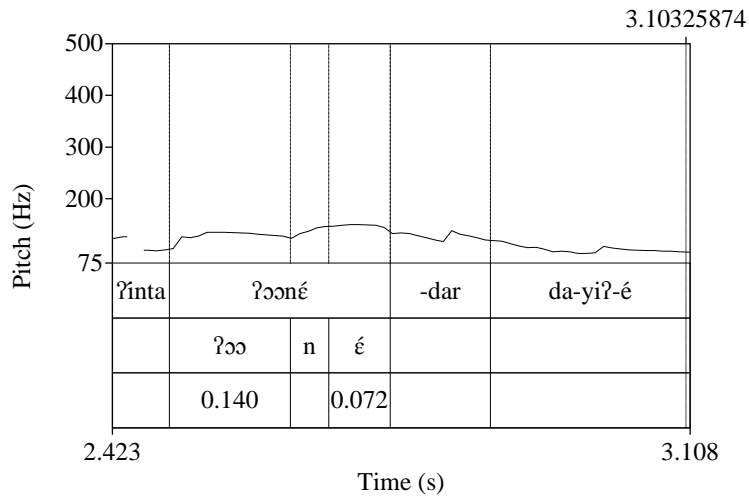
ꢖꢏꢏꢏ [ꢖꢏꢏ¹ꢏꢏ] ‘house:M’ VL2 = 0.080



In (3) below, the final vowel of the masculine noun *ɔnɛ* is even shorter than that of the previous example (0.072 seconds). Most importantly, the final stress is not realized with a fall, but it is almost a level tone:

- (3) ʔínta ʔɔ́ɔné-dar da-yiʔ-é
1SG house:M-ALL1 IPFV-go-PRES
I will go to the house (M)

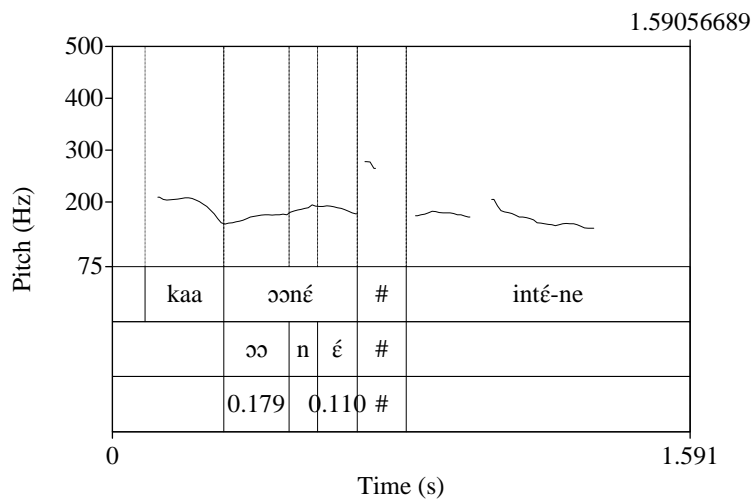
၇၁၁၈ [၇၁၁'၈] 'house:M' VL2 = 0.072



If the masculine inflected noun is followed by a pause, the final vowel can be lengthened and the final stress is realized as falling tone. The pause in the diagram is represented by #:

- (4) **káa** **၇၁၁၈** **inté = ne**
 DEM1.M house:M 1SG:M = COP
 this house (M) is mine

၇၁၁၈ [၇၁၁'၈] 'house:M' VL2 = 0.110



Prominence in Hamar nouns is analysed as stress since it is obligatory, culminative and unpredictable (but see 2.4.2). Nouns in Hamar have lexical stress when they are uninflected, and get a final grammatical stress when they are inflected for masculine gender. This final stress is realized as falling tone and it is applied post-lexically.

Prominence has a high functional load in verbs. As for nouns, prominence in verbs is limited to one syllable per word, thus there are no $\acute{o}.\acute{o}$ nor $\sigma.\sigma$ verb types. Different from nouns, prominence in verbs is not lexically distinctive, but grammatical: verb roots are stress-less, and prominence is attested only on verbal suffixes. The simplest verb stem consists of the verb root plus $/\acute{a}/$. The $/\acute{a}/$ stem is used as the citation form of the verb, thus prominence is attested always on the right-most edge of the citation form:

c'a-á	[tʃ'à'á]	'clap'
gi-á	[gì'á]	'tell'
bul-á	[bù'lá]	'open'
shan-á	[ʃà'ná]	'buy'
dorq-á	[dòr'qá]	'sit'
?ukuns-á	[?ùkùn'sá]	'rest'

In the citation form of monosyllabic verb stems, prominence is found on the right-most vowel \acute{a} . This means that in monosyllabic verb stems formed by two consecutive vowels, contour tones can arise. As it was illustrated above in 2.4.1, there are no contour tones on consecutive vowels in nouns, thus the following minimal pairs exist in the language:

káa	[káá]	'this.M'
kaá	[kàá]	'pour'
sáa	[sáá]	'over there'
saá	[sàá]	'sweep'
t'ía	[t'íá]	'black'
tíá	[tìá]	'take'

When the citation form of the verb is used in the imperative mood and it is pronounced with emphasis, the last vowel can be phonetically long:

yi?-á	'go!'	[jì'ʔá] ~ [jì'ʔáá]
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The citation form of the verb is used for the majority of verbal paradigms, that is, verbal suffixes can be suffixed to the verb stem ending in $/\acute{a}/$, see chapter 6 and chapter 9 for an overview of verb roots and verb stems. The suffix $/\acute{a}/$ however can be substituted for other suffixes depending on TAM and person marking. The plural addressee of the imperative for instance is marked by the suffix $/\acute{é}/$:

yiʔ-á	‘go!’ (IMP.2SG)	[jì'ʔá]
yiʔ-é	‘go!’ (IMP.2PL)	[jì'ʔé]

The position of stress may distinguish verb tenses, for instance stress placement distinguishes negative present and negative past inflections:

ɖes-atíne	‘I don’t know’	ɖes-átine	‘I did not know’
ɖes-atáne	‘you don’t know’	ɖes-átane	‘you did not know’

A few noun-verb pairs are segmentally identical, but prosodically different as the following examples show:

qána	‘stream’, noun	qaná	‘hit’, verb
búla	‘egg’, noun	bulá	‘jump’, verb

2.4.2 Tone

An analysis in terms of tone is supported by examples attested in both the verbal and the nominal domain. In the verbal domain, a final falling tone is found on the 3rd person of the negative present inflection /-ê/. This creates an opposition between the plural addressee of the imperative (illustrated in 2.4.1), and the 3rd person negative:

wuc’ê	‘he/she doesn’t drink, they don’t drink’
wuc’é	‘drink!’ (plural addressee)

The last vowel of the negative present inflection can be lengthened in emphatic speech:

wuc’ê	[wù'tʃ'ê] ~ [wù'tʃ'ée]
--------------	------------------------

The same inflection is found in the negative existential predicator, which contrasts with the question word ‘where’:

qolê	‘there is not’	qóle	‘where is?’
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Similarly, the negative equative copula carries a final falling tone and contrasts with the locative case suffix:

tê	‘is not’	-te	‘in’
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Verb roots can be affixed with nominal inflections to form relativized verbs.

Relativized verbs which agree in gender with a masculine head noun take on the same masculine gender marker introduced in 2.4.1, i.e. the suffix */-â/*:

wuc'á	'drink'	[wù'tʃá]
wuc'â	'the one (M) who drank'	[wù'tʃâ]

For nouns and verbs which are segmentally identical but which differ prosodically, the following contrasts can arise:

qána	'stream'	noun, uninflected form
qaná	'hit'	verb, citation form
qanâ	'stream:M'	noun, masculine form
qanâ	'the one who hit'	noun, relativized masculine verb
qané	'hit!'	imperative 2 nd plural addressee
qanê	'he/she does not hit'	verb, negative present 3 rd person

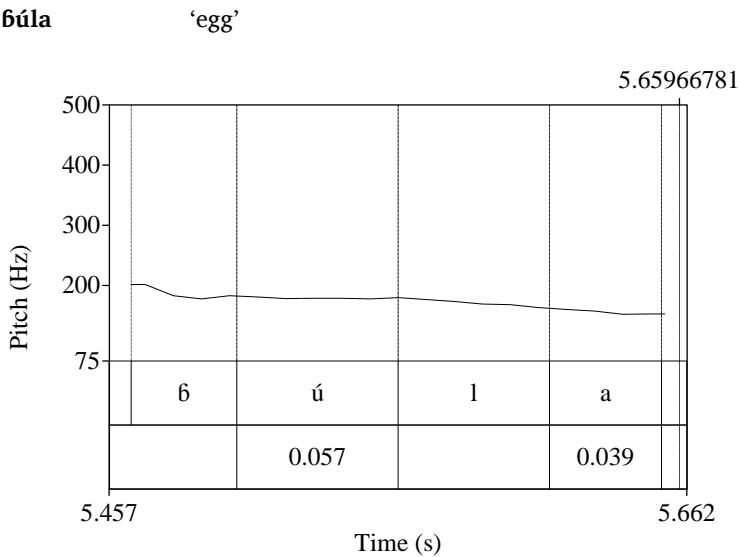
The difference between the masculine form of *qána* 'stream' and the masculine of the relativized verb *qaná* 'hit', is purely prosodic. In nouns such as *qána* (that is, nouns which have lexical stress on the first syllable in the uninflected form), the high pitch on the first syllable is often realized in the masculine inflected form as well:

qána	'stream'	[qána]
qanâ	'stream:M'	[qánâ]~[qánâà]
hápa	'fat-tailed sheep'	[hápa]
hapâ	'fat-tailed sheep:M'	[hápâ]~[hápâà]

There is variation in the realization of these masculine inflected nouns, and the realization of pitch on the syllable that carried lexical stress varies among speakers and in the same speaker's speech. The fact that the lexical stress and the final grammatical stress (which is realized as falling tone) are both realized might be due to the fact that the final stress in masculine nouns is applied post-lexically.

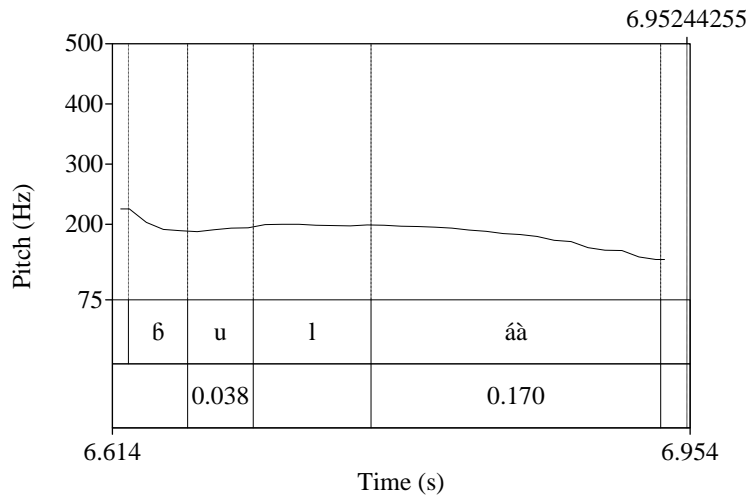
For this reason, there is opposition between a masculine inflected noun such as *qanâ* 'stream:M', which can be realized as [qánâ], and the relativized masculine verb *qanâ* 'the one (M) who hits', which is realized always with low pitch on the first syllable: [qànâ]. These examples pose a challenge for a stress analysis: the option for a high vs. low opposition on the first syllable of disyllabic words with final falling tone is a violation of culminativity and suggests the existence of two independent systems. The nature of prominence on nouns and verbs is moreover quite different: prominence in nouns is a lexical property and it shows the characteristics of stress in that it is a property of the word and it is culminative and obligatory. In verbs, not only prominence is grammatical and it is a property of the morpheme (i.e. verbal inflections), but it shows the existence of two separate tonemes: a high tone (*qané*

hit.IMP.2PL) which contrasts with a falling tone (*qanê* hit.PRES.NEG.3). The two falling tones which are found on the final syllable of masculine inflected nouns (*qanâ* stream:M) and on the 3rd person negative inflection (*qanê* hit.PRES.NEG.3), are different in that the former is applied post-lexically but it is still a lexical property of masculine nouns, whereas the latter has a purely grammatical function. For the sake of clarity, the PRAAT diagrams below show the shape of pitch in three words uttered in isolation: the uninflected form and the masculine form of *búla* ‘egg’ is contrasted with the verb *bulá* ‘jump’.



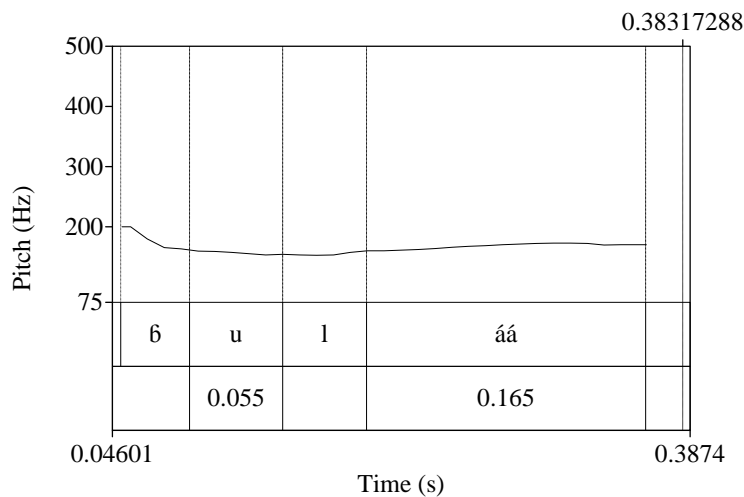
The uninflected form for ‘egg’ has a level high pitch on the first syllable which is higher than the pitch on the last syllable. In the M form the pitch contour on the first syllable is slightly rising, and then it sharply falls on the last long vowel:

bulâ 'egg:M'



Since these words were recorded in isolation, the final vowel in the masculine noun above and in the imperative form below is exceptionally long. In the verb *bulá* 'jump' the pitch on the first syllable has a slight fall and then raises on the last long vowel, remaining constantly high until the end of the utterance.

bulá 'jump'



The analysis of the prosodic system of Hamar is far from being complete and needs further investigation. Future acoustic analyses which take into account also phrasal intonation will give a better account of the prosodic facts. Moreover, the fact that stress and tone are competing produces a hybrid system which should be tested for

diachronic change, by studying for example the synchronic variation across different generations and different dialects of Hamar.

2.5 Phonological and morphophonological processes

Morphophonological processes are described in this section. The realizations of consonant phonemes have been already illustrated in the previous sections. Phonological rules are numbered P1, P2, and morphophonemic rules are numbered MP1, MP2 etc. This numbering will be used throughout this work whenever reference to a (morpho)-phonological process is needed. Numbering does not reflect rule ordering. Forms in parenthesis are unattested intermediate stages.

P1 Sibilant harmony

P2 Consonant metathesis

P3 i prosthetis

P4 Assimilation of plural and feminine markers

P5 Vowel coalescence

P6 Vowel deletion

P7 Complete harmony

P8 Voicing assimilation

P9 Consonant elision after palato-alveolar nasal

MP1 Apocope

MP2 Clitic reduction

MP3 Deletion of final vowel of feminine relativizing suffix

MP4 Deletion of word-initial /h/ before subject clitics

MP5 Masculine mid-vowel lowering

2.5.1 Overview of (morpho)phonological processes

P1 Sibilant harmony

Sibilant harmony is a root-structure condition but it extends as well across morpheme boundaries. Sibilant consonants occurring in the same word must agree in place of articulation, but do not need to be identical. The sibilant consonants in Hamar are: /c/ /j/ /c'/ /s/ /z/ /sh/.

shooshí	‘guest’
c’ác’i	‘sky’
sosó	‘eagle’
c’arshá	‘sharpen’
c’agáj	‘green’
zarsí	‘grass’
shic cá	‘soften’
shamáj	‘albino cattle coat colour’
c’íshi	‘bile’

Sibilant harmony operates from left to right and across non-sibilant consonants.²² It can be observed across morpheme boundaries when the causative derivational suffix /-s/ is affixed to a verb root:

giá	‘tell’	gisá	‘make sb. tell’
deesá	‘kill’	deesisá	‘make sb. kill’
gishá	‘herd’	gishishá	‘make sb. herd’
shaná	‘buy’	shanshá	‘sell’

P2 Consonant metathesis

Metathesis occurs as a structure preservation rule. The only permitted consonant clusters in Hamar are allowed at syllable boundaries and the first segment of the sequence can only be a sonorant (liquids or nasals). The fricatives /s/ and /sh/ have been attested so far only before a velar and a bilabial stop. Metathesis inverts the position of two segments in an illicit sequence, so that the first element of the cluster is a sonorant or a fricative segment. Metathesis is frequent when the feminine (-no) and plural (-na) inflections are suffixed directly to consonant-ending roots, in particular when the first segment of the cluster is a stop. This can happen with consonant ending nouns and when the terminal vowel of a noun is unstable (see chapter 3):

tudí	‘buttocks’	(tud-no)	>	tundó
tubáqe	‘type of tree’	(tubaq-no)	>	tubánqo

After metathesis, nasal assimilation occurs if the nasal precedes a bilabial consonant:

?atáβ	‘tongue’	(ataβ-na)	>	?atámβa
kut’úβo	‘housefly’	(kut’uβ-no)	>	kut’úmβo

²² The direction of harmony correlates with the suffixal nature of Hamar.

In verbal derivation, suffixation of the causative /-s/ can produce illicit sequences when the causative /-s/ is affixed to verb roots. Metathesis inverts the illicit sequence, after sibilant harmony P2:

jaagá ‘sew’ (jaags, jaashg) > **jashká**

Different voicing is not allowed in the same cluster after metathesis, see P8. Metathesis is found also in the derivation of some ordinal numbers from cardinal numbers by means of the suffix /-so/.

lax ‘six’ (lax-so) > **lásxo ~ lásko**

The forms [lásxo~láhso] have been attested as well. Two fricatives can cluster together but a sequence with a stop as second segment is always preferred, see also chapter 5, section 5.5.2 on ordinal numbers.

P3 i prosthesis

A prosthetic vowel -i can be inserted after consonant ending words:

baz ‘lake’ **bázi**
?áan ‘arm’ **?áani**

Some borrowings from Amharic get a prosthetic vowel -i:

sílki ‘phone’ (Amharic səlk)
múzi ‘banana’ (Amharic muz)

The prosthetic vowel -i is inserted between consonant ending nouns and various morphemes such as the copula /-ne/, the oblique case /-n/, the inclusive marker /-l/, the genitive case /-sa/:

gudúḅ	‘tall’	gudúḅ-ine	‘is tall’
hámar	‘Hamar’	hámar-in	‘Hamar-F.OBL’
yer	‘thing’	yér-il	‘a thing as well’
dong	‘five’	dóng-isa	‘of five’

P4 Assimilation of plural and feminine markers

When affixed directly to the root, the nasal consonant of the plural and feminine markers /-na/ and /-no/ takes on the manner of articulation of a preceding liquid or nasal segment.

segeré ‘dik-dik’ (seger-no) > **segerró**
qulí ‘goat’ > **qullá**

In a few instances, suffixation of nominal inflections creates illicit clusters such as /bn/, /pn/, /tn/, /zn/:

náabi	‘name’	(nab-no)	> námmo
galáp	‘yellow’		> galámmo
qootí	‘beehive’		> qonnó
maz	‘initiate boy’		> mánno

In these cases assimilation takes place bidirectionally: place assimilation occurs from left to right and nasal assimilation from right to left.

P5 Vowel coalescence

Vowel coalescence occurs across morpheme boundaries and it can be observed especially in the nominal domain, between the masculine suffix /-â/ and nominal terminal vowels /e i o/ of vowel ending nouns. Nouns ending in the diphthong /au/ and /ia/ are inflected by the masculine suffix /-tâ/ and will be treated in more details in chapter 3.

Vowel coalescence gives rise to the mid-low vowels /ɛ/ and /ɔ/ according to the following pattern:

i + a > ɛ
e + a > ɛ
o + a > ɔ

?aizí	‘goat hide’	>	?aizê	‘goat hide:M’
bagadé	‘cooked blood’	>	bagadê	‘cooked blood:M’
búqo	‘knee’	>	buqô	‘knee:M’

On nouns in isolation, the masculine suffix /-â/ can be realized as a devoiced vowel, but it is hardly ever realized in connected speech:

qáski	‘dog’	
qaskê	‘dog:M’	[qaskê] ~ [qaské̥]
qaskê káa	‘dog:M DEM1.M’	[qaskê káa] ~ [qaské̥ káa]

Vowel coalescence is applied also to loanwords. For instance, the Amharic loanword for phone [səlk], is realized in Hamar with the epenthetic final vowel -i: *sílki*, the general form, becomes *silkê* in the masculine.

The masculine suffix is not the only trigger for vowel coalescence. Vowel coalescence is found for instance in the shortened forms of third person object pronouns.

kí = ɗan	‘3 = ACC’	>	kéen	‘3:ACC’
kó = ɗan	‘3F = ACC’	>	kóɔn	‘3F:ACC’

In fast speech, the implosive ɗ can be reduced to glottal stop, and glottal stop in intervocalic position is often deleted (cf. 2.1.1). The vowels /i o/ and /a/ thus merge, giving rise to the shortened forms illustrated above. Other persons, such as the first person plural (*wóɗan*) or the second person plural (*yéɗan*) have a shortened form but the quality of the vowel is not obligatory low, see chapter 4, section 4.1.2 for further details.

When the optative marker /-ánna/ is suffixed to clitic pronouns, coalescence occurs between the vowel of the clitic and the initial vowel of the optative marker /a/. Whereas coalescence always takes place in the first person singular and third persons, in the first and second plural it is optional and the pronunciation varies among speakers and within the same utterance:

(?i-ánna)	>	énna	(1SG:OPT)
(ha-ánna)	>	hánnna	(2SG:OPT)
(ki-ánna)	>	kénna	(3:OPT)
(ko-ánna)	>	kónnna	(3F:OPT)
(wo-ánna)	>	wónna ~ wɔnnna	(1PL:OPT)
(ye-ánna)	>	yénna ~ yénnna	(2PL:OPT)

Coalescence occurs also after MP4 deletes the word-initial glottal fricative of the reason clause marker *hattáxa* and other verbs with word-initial glottal fricative, see MP4 below. Vowel coalescence occurs word-internally only in the verb *giá* ‘hit’. Vowel coalescence often occurs when the verb is suffixed with subordinative markers.

[waakí ɣéáise niʔidí]

- (5) **waakí ɣiá-ise niʔ-idí**
 cattle hit-CNV1 come-PF
 (they) came herding the cattle

Vowel coalescence in this context is unusual since the vowel sequence /ia/ is allowed in monosyllabic noun roots and verb stems such as *sía* ‘bad’ and *giá* ‘tell’. When the verb *giá* ‘tell’ is suffixed with the same subordinative marker reported in example (5), coalescence does not take place, cf. (6) below with (5):

[budámo giáise gobidí]

- (6) **budámo giá-ise gob-idí**
 lie tell-CNV1 run-PF
 (he) lied and ran away

The final vowel of the question word *hamó* ‘where?’ is lowered to ɔ if the following word is the second person clitic pronoun *ha-*. MP2 deletes the initial consonant of the clitic pronoun (indicated by < >):

[hamɔa jiʔéʔ]

- (7) **hamó** < h > a = yiʔ-éʔ
 where.NSP 2SG = go-PRES.INT
 where are you going?

P6 Vowel deletion

Vowel deletion occurs only after clitic reduction (MP2). This is a peculiar case in which MP2 deletes the glides of clitic pronouns, and two vowels at word-boundaries becomes adjacent. The two consecutive vowels are reduced to one segment. In the examples below, the deleted vowel and the deleted glide of the clitic pronoun are written within arrow head symbols < >. P6 occurs especially in connected and allegro speech.

[waadímano ʔaʃké]

- (8) **waadíma-n** < o > < w > o = ʔashk-é
 work-F.S 1PL = do-PRES
 Let's work!

If the vowels have different qualities, the first vowel of the sequence is dropped so that the vowel belonging to the clitic pronoun remains in place:

[gáago jigé]

- (9a) **gáag** < i > < w > o = yig-é
 gaagi 1PL = play-PRES
 Let's play the gáagi game!

[kánki xóda jiʔé]

- (9b) **kánki-x** < a > < w > o = da-yiʔ-é
 car-INS 1PL = IPFV-go-PRES
 We will go by car

[ʔoonínti ʔardé]

- (9c) **ooní-n-t** < e > < ʔ > i = ʔard-é
 house-F.OBL-LOC 1SG = enter-PRES
 Let me enter the house

[dímekati dáade]

- (9d) **dímeke-t <e>** **<ʔ> i = dáa-de**
 Dimeka-LOC 1SG = exist-PFV
 I am in Dimeka

P6 can be observed especially in complex verbal paradigms which combine verb stems, clitic pronouns, and auxiliaries, see chapter 4 and chapter 6 for further details. Future tense for instance is expressed by reduplication of the verb stems. The clitic pronoun and the aspect marker /da/ are slotted in between the two verb stems. After MP2 deletes the initial segment of the clitic pronoun, the first vowel of the sequence is dropped:

[qanéda qané]

- (10) **qan <á> = <y> e = da** **qan-é**
 hit = 2PL = IPFV hit-PRES
 You will hit

P6 does not occur when a verb stem ending in /-á/ is followed by the 1st person singular clitic pronoun /ʔi/ (see MP2). Compare example (11) below with example (9) above where the 1st person singular pronoun /ʔi/ is used:

[qanáida qané]

- (11) **qaná = ʔi = da** **qan-é**
 hit = 1SG = IPFV hit-PRES
 I will hit

Progressive aspect is expressed by means of a locative construction of the type ‘I am in X’, where X is the lexical verb and pronominal subject marking is marked on the existential verb. P6 and MP2 take place between the locative case /-te/ and the following clitic pronouns: the first consonant of the clitic pronouns is dropped (MP2) and the final vowel of the locative case, which is the first of the sequence, is deleted (P6):

[wutfʔáti dáade]

- (12a) **wucʔá-t <e>** **<ʔ> i = dáa-de**
 drink-SE 1SG = exist-PFV
 I am drinking

[wutfʔáta dáade]

- (12b) **wucʔá-t <e>** **<h> a = dáa-de**
 drink-SE 2SG = exist-PFV
 you are drinking

[wutʃ'áto dáade]

- (12c) **wuc'á-t <e>** <w> **o = dáa-de**
 drink-SE 1PL = exist-PFV
 we are drinking

[wutʃ'áte dáade]

- (12d) **wuc'á-t <e>** <y> **e = dáa-de**
 drink-SE 2PL = exist-PFV
 you (PL) are drinking

Other verbal paradigms show full realization of the clitic personal pronouns. See chapter 4 and chapter 6 for more details.

P7 Complete harmony (vowel copy)

The low vowel /a/ of monosyllabic verb roots show assimilation for all vowel quality features with the following verbal suffixes. Harmony operates from right to left:

ka-á	'pour!' (imperative singular addressee)	[kàá]
ka-é	'pour!' (imperative plural addressee)	[kèé]
ki = da-é	'let him be' (da- 'to be')	[ki = dèé]

Complete harmony operates as well across an intervening glottal stop:

gaʔ-á	'bite!' (imperative singular addressee)	[gaʔá]
gaʔ-é	'bite!' (imperative plural addressee)	[geʔé]
baʔ-ó = i = de	'I'll bring' (baʔ- 'bring')	[boʔóide]

Translaryngeal harmony has been described for the neighbouring languages Arbore (Hayward 1984:73-76) and Dhaasanac (Tosco 2001:31), as well as in Somali (Armstrong 1934).

P8 Voicing assimilation

Different voicing in the same cluster are not allowed after metathesis has inverted an illicit sequence. This can be seen with both nominal inflections and verb derivations:

ʔaarák	'uncle'	(ʔarak-na)	> ʔaaránga
sagá	'go across'	(sag-s)	> saská
c'uubá	'wash clothes'	(c'ub-s)	> c'ushpá

Clusters occurring in lexical items can have different voicing:

gasgó	‘wheat’
dónko	‘speech’

P9 Consonant elision after palato-alveolar nasal

The palato-alveolar nasal /ɲ/ cannot cluster with other consonants. Sequences involving ɲ + C arise with suffixation of the nominal inflections /-na/ and /-no/ followed by metathesis and assimilation:

shooshí	‘guest’	(shoshna, shonsha, shonsha)	> shoná
c’agáj	‘green’	(c’agajno, c’aganjo, c’aganjo)	> c’agáno

MP1 Apocope

Apocope involves truncation of the final syllable before suffixation of nominal inflections /-no/ and /-na/. Nouns ending in a coronal or a sonorant segment followed by a front vowel are particularly affected:

ráat’i	‘milk’	> ráano
naasí	‘child’	> naaná
wálqanti	‘aloe vera’	> wálqanna
anqási	‘lamb’	> anqána

When other suffixes such as the dative case /-na/ are suffixed to such nouns, apocope does not take place:

naasí-na	‘child-DAT’
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MP2 Clitic reduction

Short form I clitic pronouns (see chapter 4) are shortened forms of independent pronouns and they are used for subject marking on main verbs in independent clauses. These clitics have a CV syllabic structure and begins with a glide: /ʔi/ (1SG), /ha/ (2SG), /wo/ (1PL), /ye/ (2PL). 3rd person clitic pronouns /ki/ and /ko/ are unaffected by this morphophonological rule. When short form pronouns occur in between words, the approximants /h, ʔ, w, y/ are dropped. This can be observed particularly in complex paradigms where clitics are slotted in between verb stems and auxiliaries. In (13) below the /h/ of the 2nd person singular occurring between a verb stem and an auxiliary is dropped, and P6 deletes one of the two adjacent vowels:

- [bardáda bardé]
- (13) **bard’ < á > = < h > a = da** **bard’-é**
 be.drunk = 2SG = IPFV be.drunk-PRES
 You will be drunk

The initial glottal stop in the 1st person singular clitic pronoun /ʔi/ in example (14a) is fully realized. However, when it occurs intervocalically, the glottal stop is deleted (14b):

- [ʔína ʔimá]**
 (14a) **ʔí = na ʔimá**
 1SG = DAT give.IMP.2SG
 Give me!
- [bardáida bardé]**
 (14b) **bardá = <ʔ>i = da bard-é**
 be.drunk = 1SG = IPFV be.drunk-PRES
 I will be drunk

In connected speech and between words, it has been noticed that the glide of the 1st and 2nd person plural can be deleted even if they are proclitics. Compare the first example, where *w* is not dropped, with the second example, where the proclitic /wo/ undergoes deletion of the glide:

- [wojiʔé]**
 (15a) **wo = yiʔ-é**
 1PL = go-PRES
 Let's go!
- [ʔoonínsa buudómbaro dáade]**
 (15b) **ooní-n-sa buudó-m-bar <w>o = dáa-de**
 house-F.OBL-GEN back-F.OBL-AD 1PL = exist-PFV
 we are behind the house
- [hárne wotʃ'imé]**
 (15c) **hárn <a> <y>e = woc'im-é?**
 why 2PL = argue-PRES.INT
 why are you arguing?

In example (15c) vowel deletion P6 takes place after deletion of the glide.

MP3 Deletion of final vowel of feminine relativizing suffix

The final vowel of the feminine relative suffix /-óno/ is deleted when the feminine relativized verb is followed by the accusative case /-dan/ or whenever the relative clause does not function as subject (cf. chapter 8, section 8.4, and chapter 7, section 7.4.2):

[éeno imbaskóndan janê]

- (16a) **éeno** **in = bask-óno-dan** **shan-ê**
 people:F.S 1SG = carry-REL.PAST.F-ACC buy-PRES.NEG.3
 the people won't buy what I have carried

[één gurdánte dóondan eeláise]

- (16b) **één** **gurdá-n-te** **da-óno-dan** **eelá-ise [...]**
 people.F.OBL village-F.OBL-LOC be-REL.PAST.F-ACC call-CNV1
 calling the people who were in the village [...]

In the previous example the low vowel /a/ of the verb root *da-* 'to be' assimilates to the quality of the following vowel suffix, as mentioned in P7 above.

MP4 Deletion of word-initial /h/ after subject proclitics

The breathy-voiced glottal approximant /h/ is deleted when subject clitic pronouns are attached to the reason clause marker *hattáxa*.

(ʔi-hattáxa)	>	ettáxa	(1SG:REAS)
(ha-hattáxa)	>	hattáxa ²³	(2SG:REAS)
(ki-hattáxa)	>	kettáxa	(3:REAS)
(ko-hattáxa)	>	kottáxa	(3PL:REAS)
(wo-hattáxa)	>	wottáxa ~ wottáxa	(1PL:REAS)
(ye-hattáxa)	>	yettáxa ~ yettáxa	(2PL:REAS)

After deletion of the glottal fricative, vowel coalescence P5 takes place between the final vowel of the subject clitics and the vowel *a*. MP4 applies to verbs beginning in /h/:

(ko-hambadé)	>	kɔmbadé
(ki-hambadé)	>	kɛmbadé

MP5 Masculine mid-vowel lowering

The masculine inflections /-â/ and /-tâ/ lower the mid-root vowels of nouns. The assimilation is regressive and it spreads from right to left affecting previous stressed and unstressed mid-high vowels /e/ and /o/.

In consonant-ending nouns, the masculine inflection /-â/ is suffixed to the uninflected form. Mid-high stem vowels, if any, lower to /ɛ/ and /ɔ/:

ʔatáɓ	'tongue'	ʔatabâ	'tongue:M'
maz	'initiated boy'	mazâ	'initiated boy:M'

²³ The example with the second person clitic pronoun *ha-* attached to the reason clause marker *hattáxa* is a case of haplology.

bankár	‘arrow’	bankarâ	‘arrow:M’
déer	‘red’	dëerâ	‘red:M’

Vowels assimilate also across consonant clusters:

dongár	‘elephant’	dɔŋgarâ	‘elephant:M’
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Recall that the vowel /o/ in the uninflected form of *dongár* is a mid-high vowel not affected by the following low vowel because it is unstressed (cf. 2.2.2).

Nouns belonging to declension 4 (see chapter 3, section 3.3) inflect for masculine gender by means of suffixation of the marker /-tâ/. Similar to the suffix /-â/, the suffix /-tâ/ as well lowers the mid-high stem vowels.

seelé	‘guineafowl’	sel-tâ	‘guineafowl-M’
shooné	‘hyrax’	shɔn-tâ	‘hyrax-M’

Vowel shortening in the examples above occurs to avoid CVVC.CV structure (cf. 2.2.3). The masculine suffix *-tâ* attaches directly to the nominal root: the final vowel of the uninflected nouns *seelé* and *shooné* is in fact dropped. In Omotic languages the terminal vowel of nouns is not considered part of the nominal root since it can be dropped when nominal inflections are suffixed, see chapter 3 for more information on this topic.

In vowel ending nouns inflected by means of the suffix /-â/, coalescence (P5) takes place between the terminal vowel and the masculine suffix. Given the mismatch between the target vowels of MP4 (/e o/) and those involved in P5 (/i e o/), and given the fact that nouns vary in terms of vowel composition and position of stress, the outcomes of the masculine inflected forms can be diverse, see 2.6 for a comparison.

The masculine inflection targets the mid-high vowels in the nominal root lowering them to /ɛ/ and /ɔ/:

ʔooní	‘house’	>	ʔɔɔnê	‘house:M’
c’íilo	‘ant’	>	c’iilɔ	‘ant:M’ *c’ɛɛlɔ

The final vowel /i/ in *ʔooní* changes to ɛ because of coalescence (P5) with the masculine suffix /-â/. MP4 is responsible for the lowering of the mid high vowel /oo/ in the root. The root vowel /ii/ in *c’íilo* is unaffected by MP4, but the final vowel /o/ fuses with the masculine suffix /-â/ (P5), this is the reason why the masculine form of *c’íilo* cannot be *c’ɛɛlɔ.

Root-internal high vowels /i u/ are never lowered: neither by an adjacent low vowel /a/ when they are stressed (cf. 2.2.2), nor by the masculine inflection /-â/:

qúna	‘resin-based incense’
quṇâ	‘resin-based incense:M’
díta	‘type of tree’
dítâ	‘type of tree:M’
muná	‘sorghum dumpling’
munâ	‘sorghum dumpling:M’
mirjá	‘kudu’
mirjâ	‘kudu:M’

Since the high vowel /i/ is affected by vowel coalescence (P5) but not by MP4, there are masculine nouns of the type CiCi in which root internal /i/ is unchanged, but final /i/ is lowered to /ɛ/ after vowel coalescence:

bíiri	‘three-pronged stir stick’	
biirê	‘three-pronged stir stick:M’	*bɛɛrê
zikí	‘goat faeces’	
zikê	‘goat faeces:M’	*zɛkê

Masculine mid-vowel lowering operates on trisyllabic nouns as well, although a few exceptions have been attested where the mid-low vowel of the first syllable is optionally lowered:

noqóle	‘type of bracelet’	>	noqɔlê ~ noqɔlê
qómbalti	‘shell’	>	qɔmbaltê
onkólo	‘calabash handbag’	>	ɔnkɔlɔ ~ onkɔlɔ
segeré	‘dik-dik’	>	segerê
qómoro	‘Adam’s apple’	>	qɔmɔrɔ

Intervening high vowels in the nominal root block MP4:

goití	‘pathway’	>	goitê
?eiké	‘grandfather’	>	?eikê
korqishá	‘francolin’	>	korqishâ
shekíni	‘beads’	>	shekinê
tesíʃe	‘axe’	>	tesíʃê
kóofini	‘squirrel’	>	koofinê

Masculine mid-vowel lowering is morphologically restricted to the masculine inflection, and other suffixes do not lower the mid-high vowels of nominal root. For instance the plural inflection /-na/ which is suffixed to the uninflected form of a noun, normally does not trigger lowering of the mid-high root vowels:

zóbo ‘lion’ **zɔbɔ̃** ‘lion:M’ **zóbo-na** ‘lion-PL’
 *zóbɔna is not attested.

This is valid even if we suppose that only stressed vowels adjacent to a post-tonic /a/ can be targeted by harmony (cf. 2.2.2):

meté ‘head’ **metê** ‘head:M’ **meté-na** ‘head-PL’
 *meténa

Likewise, in nouns containing the mid-low vowels /ɛ/ and /ɔ/, nominal inflections do not ‘harmonize’ with the root vowels:²⁴

qɔ́ɔc’a ‘nape’
qɔ́ɔc’a-no ‘nape-F.S’ *qɔ́ɔc’ano

yéɛla ‘roof’
yéɛla-no ‘roof-F.S’ *yéɛlano

Other suffixes containing the low vowel /a/, such as the dative /-na/, the genitive /-sa/, the instrumental /-ka/ and so on, do not trigger lowering of root mid-high vowels. However, it has been noted that a few nouns whose plural inflected forms result in disyllabic word types, may ‘harmonize’ with the low vowel of the plural suffix /-na/. For these nouns, the terminal vowel of the general form is not stable and similar to consonant ending nouns, the feminine and plural inflections are suffixed to a consonant and assimilate to it (P4). This results into a disyllabic word:

kerí ‘door’ (ker-na) **kerrá** ‘door:PL’
demí ‘side’ (dem-na) **dɛmmá** ‘side:PL’
déer ‘red’ (deer-na) **dérra** ‘red:PL’

Mid-vowel lowering has been attested as well in the plural form of some monosyllabic words:

²⁴ This proves that Hamar does not have an ATR vowel harmony system. If harmony in Hamar was a full-fledged root structure condition, one would have expected either harmonization of mid-high root vowels with any other suffix containing a low vowel, or harmonization of suffix vowels with stem vowels.

In a dominant-recessive type of harmony, a vowel carrying a dominant feature (in this case the low vowel /a/) should trigger change in any recessive vowel (/ɛ/ and /o/), operating within and across the morpheme boundaries. Similarly, in an allegedly stem-controlled harmony system, the phonological characteristic of the stem should induce change in the suffix vowels.

pée	‘land’	pée-na	‘land-PL’
róo	‘leg’	róo-na	‘leg-PL’

The plural form of *éedi* ‘person, man’ can be uttered with both a mid-low or a mid-high vowel, depending on the speaker:

éedi	‘man, person’	ée-na ~ ée-na	‘people-PL’
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2.6 Realization of coalescence, mid-vowel lowering and stress in masculine nouns

Vowel coalescence is a phonological process occurring across morpheme boundaries, between the vowels /i e o/ and the low vowel /a/ (P5), whereas mid-vowel lowering (MP5) is a morpho-phonological process triggered by the masculine inflections /-â/ and /-tâ/, which target the nominal root vowels /e o/. P5, MP5 and stress realization are part altogether of the phonological realization of the masculine suffix /-â/ and /-tâ/, and this section will illustrate the interaction of the three phenomena. As illustrated in 2.4.1, all masculine nouns get a final stress which is realized as falling tone. For nouns which already have final stress in the uninflected form (i.e. nouns ending in /í/ /é/ /ó/), P5 and MP5 are the main expression of morpheme realization, since the difference between final lexical stress and final grammatical stress (^) is lost in connected speech.²⁵ If the uninflected form has final stress and its root vowels are not mid-high, the masculine inflection is expressed by vowel coalescence alone:

c’aac’í	‘root’	>	c’aac’ê	‘root:M’
nukí	‘nose’	>	nukê	‘nose:M’
giní	‘vein’	>	ginê	‘vein:M’

If the root vowels of a stress-final uninflected form are mid-high, masculine is marked by both vowel coalescence and mid-vowel lowering:

meté	‘head’	>	metê	‘head:M’
sosó	‘eagle’	>	sosô	‘eagle:M’
toré	‘plain’	>	torê	‘plain:M’
geccó	‘old’	>	geccô	‘old:M’
wotí	‘forehead’	>	wotê	‘forehead:M’
kerí	‘door’	>	kerê	‘door:M’

²⁵ Unless root vowels /a i u/ combine with final /-â/, such as *mirjá* ‘kudu’, *mirjá* ‘kudu:M’. In such cases the final falling tone is the only expression of masculine realization, but this difference is often lost with case suffixes. For these nouns the difference between uninflected and masculine form is not noticeable only on the basis of phonological criteria.

In 2.2.2 it was shown how stress can affect vowel realization, in particular when vowels are followed by a post tonic low vowel /a/.

For nouns ending in /á/, MP5 (and stress when the falling final tone is audible) are the only cues for masculine inflection: the mid-high root vowels harmonize whereas stress remains on the final syllable (or it is realized as falling tone). Coalescence between the two vowels /a/ results in final vowel length on nouns in isolation:

deeshá	‘medicine’	> dēeshâ ‘medicine:M’
doolá	‘milk container’	> doolâ ‘milk container:M’

In nouns with stressed mid-low vowels in the root, and final /a/, the masculine inflection is signaled only by the position of stress, which is shifted to the last syllable and it can be realized as falling:

déega	‘dumb’	> dēegâ ‘dumb:M’
shólba	‘light’	> sholbâ ‘light:M’

The role that vowel coalescence, stress and mid-vowel lowering play in cueing morpheme realization of the masculine suffix /-â/ is schematically displayed in the following tables, where all the possible outcomes are summarized. The occurrence of one process over the other depends on the vowel patterns of each general form and the position of stress, thus any possible Hamar word-type has been included. C can be interpreted as a single consonant or a sequence of consonants, since MP5 can spread across clusters. Vowels can be interpreted as short or long. Final consonants are not written, thus words such as *dongár* are represented by a CoCá word type.

In the examples illustrated in the tables 2.4, 2.5. and 2.6 below, stress always plays a role in cueing masculine inflection, at least when nouns inflected for masculine gender are not followed by case suffixes (cf. 2.4.1). When the difference between the final lexical stress of the uninflected form and final falling tone of the masculine form is lost in connected speech, stress cannot taken into consideration. In this case vowel coalescence (table 2.5) and mid-vowel lowering (2.6) are the only audible cue for masculine inflection.

Table 2.4.: Masculine inflection cued only by stress

General form	Masculine	Examples	
CáCa	CaCâ	lába	laḃâ
CúCa	CuCâ	púla	pulâ
CíCa	CiCâ	zíga	ziigâ
CéCa	CeCá	yéela	yēelâ
CóCa	CoCá	qócc’a	qōcc’â

Table 2.5: Masculine inflection cued by final vowel coalescence (and stress)

General form	Masculine	Examples	
CaCé	CaCê	t'aḃé	t'aḃê
CuCé	CuCê	tulé	tulê
CiCé	CiCê	tigé	tigê
CaCí	CaCê	banqí	banqê
CuCí	CuCê	kurí	kurê
CiCí	CiCê	giní	ginê
CaCó	CaCṡ	c'aaró	c'aarṡ
CuCó	CuCṡ	kut'ó	kut'ṡ
CiCó	CiCṡ	giló	gilṡ

Table 2.6: Masculine inflection cued by mid-vowel lowering (and stress)

General form	Masculine	Examples	
Cecá	CɛCâ	deeshá	dɛɛshâ
CoCá	CɔCâ	doolá	dɔɔlâ

Vowel coalescence plays a central role in the realization of the masculine inflection for the majority of word-types (table 2.5), whereas mid-vowel lowering is crucial only for two word-types: Cecá and CoCá (table 2.6).

The tables below show the interaction of P5, MP5, and stress in morpheme realization. Whereas stress placement and MP5 can combine with vowel coalescence and *vice versa*, MP5 alone cannot combine with stress because stressed mid vowels in the general form are already lowered.

Table 2.7: P5 + MP5

General form	Masculine	Examples	
CeCé	CɛCê	meté	mɛtê
CeCó	CɛCṡ	geshó	gɛshṡ
CeCí	CɛCê	kerí	kɛrê
CoCé	CɔCê	toré	tɔrê
CoCó	CɔCṡ	sosó	sɔsṡ
CoCí	CɔCê	shooshí	shɔɔshê

Table 2.8: P5 + stress placement

General form	Masculine	Examples	
CáCe	CaCê	ʔáadê	ʔaadê
CáCi	CaCê	qáami	qaamê
CáCo	CaCô	jálo	jalô
CúCe	CuCê	búme	bumê
CúCi	CuCî	túni	tunê
CúCo	CuCô	shúko	shukô
CíCe	CiCê	unattested	
CíCi	CiCê	zíni	ziinê
CíCo	CiCô	c'ílo	c'iilô

Table 2.9: P5 + stress placement + MP5

General form	Masculine	Examples	
CéCe	CêCê	méde	medê
CéCo	CêCô	unattested	
CéCi	CêCê	légi	legê
CóCe	CôCê	kótte	kottê
CóCo	CôCô	zóbo	zobô
CóCi	CôCê	unattested	

