A new synchronic view on gradation and quantitative alternation in Aanaar Saami

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Background

- Castrén 1839, 1845: Earliest systematic descriptions of Aanaar Saami and Saami consonant gradation, comparison with Finnish & Estonian

- **Lagercrantz** 1927; Collinder 1929: Separation of quantitative and qualitative alternation

- **Itkonen** 1946, 1971 (etc.): Current understanding and terminology concerning quantitative and qualitative alternation and its history in AS (and other Saami languages)

- Korhonen 1967, 1969, 1981 etc.; Sammallahti 1984, 1998, 2009 etc.: Morphophonology, historical & current developments

- Morottaja & Olthuis 2022: Thorough description of AS morphophonology

- Koukkari 2020: Synchronic view to be elaborated upon in this presentation

Background

- Description of AS gradation in established terminology (from Morottaja & Olthuis 2022):
- 5 grades: strong, lengthened & shortened strong, weak, lengthened weak
- Plus: lengthening & shortening *stem types*

ASTE-VAIHTELU-TAPAHTUMA	VAHVA ASTE	VAHVAN ASTEEN		HEIKKO ASTE	HEIKON ASTEEN PIDENTYMÄ
		PIDENTYMÄ	LYHENTYMÄ		
t : đ 'mato'	t máátu	tt mááttun	- máátun	đ máádu	- máádoin
m̥ : m 'liemi'	m̥ liem̥â	mm liemmân	- liem̥ân	m liemâ	- liemáin
kk : h 'mummo'	kk ákku	- ákkun	k áákun	h ááhu	hh áhhoin
bb : b 'toinen'	bb nubbe	- nubben	b nuubán	b nube	bb nubbeest
[nnd] : nd 'poika'	[nnd] kandâ	- kandân	nd kaandân	nd kaandâ	[nnd] kandáin
lkk : lh 'maito'	lkk miel'kki	- miel'kkin	lk miälkán	lh mielhi	[llh] / lhh miel'hijn / miel'hhijn
[hht] : vt 'yksi'	[hht] ohtâ	- ohtân	ht oohtân	vt oovtâ	vtt ovttáin

Background

- Example: grades in bisyllabic verbs in the indicative (from Morottaja & Olthuis 2022):

Kaksitavuisten verbien asteet indikatiivissa

IND		1. PERS.	2. PERS.	3. PERS.
PREESENS	YKSIKKÖ	H	H	V
	KAKSIKKO	V (p)	V	V (p)
	MONIKKO	V (p)	V	V
PRETERITI	YKSIKKÖ	V (p)	V (p)	H
	KAKSIKKO	H (p)	H (p)	H (p)
	MONIKKO	H	H	V (p)

V = vahva aste

H = heikko aste

V (p): *Jos verbin vahva aste on asteessa II, merkityissä muodoissa on vahvaan asteen pidentymä.*

H (p): *Jos verbin heikko aste on asteessa II, merkityissä muodoissa on heikon asteen pidentymä.*

Background

- Established terminology relatively unchanged since Itkonen 1946.

- Itkonen's description places a lot of emphasis on *why* the system works as it does; i.e. on its diachronic background.
    - Intended for an audience of Finno-Ugricisists, not lay language learners.
        - "This is easy if you know Proto-Saamic!"

- For many consonants, the end results of different historical developments are synchronically identical!

Background

ASTE-VAIHTELU-TAPAHTUMA	VAHVA ASTE	VAHVAN ASTEEN		HEIKKO ASTE	HEIKON ASTEEN
		PIDENTYMÄ	LYHENTYMÄ		PIDENTYMÄ
t : đ 'mato'	t máátu	tt mááttun	- máátun	đ mááđu	- mááđoin
ṃ : m 'liemi'	ṃ lieṃâ	mm liemmân	- lieṃân	m liemâ	- liemáin
kk : h 'mummo'	kk ákku	- ákkun	k áákun	h ááhu	hh áhhoin
bb : b 'toinen'	bb nubbe	- nubben	b nuubán	b nube	bb nubbeest
[nnd] : nd 'poika'	[nnd] kandâ	- kandân	nd kaandân	nd kaandâ	[nnd] kandáin

Vowel Phonemes

Monophthongs

i	(y)	u
e, (ö)	e, â	o
ä, á		a

Diphthongs

ie	ye	uo
iä	uá	

- Standard orthography used in tables
  - y = *ü*
  - e = *ə* in the first syllable of a word, unless the following syllable contains *e* or *i*: *ennuv* /ənnuv/ 'much'
    - e = *e* otherwise: *enni* /enni/ 'mother', *alme* /alme/ 'sky'
  - â = *ə*
  - á = *ȧ* historically, but does not contrast with *ä*

- Stressed vowels may be divided into 2 classes (Koukkari 2022):
  - "Dark": a, o, u, i, (uo, ə)
  - "Bright": ä/á, e, iä, uá, ie, (ye)

Consonant Phonemes

	Labial	Dental	Alveolar	Postalv.	Palatal	Velar	Glottal
Nasals	m		n		ŋj	ŋ	
Stops	p b	t d				k g	
Affricates			c z	č ž			
Fricatives	f		s	š			
	v	đ			j (i)		h
Approximants			l r				

- Standard orthography used in table
  - ŋj = *ń*, đ = δ, z = *ʒ*, ž = *ǯ*
  - i = *j* post-vocalically

- Stops and affricates contrast fortis/lenis; lenis semi-voiced, fortis aspirated in non-initial position (initially no contrast, except in loans).

Quantity

- Three degrees of quantity can be distinguished for voiced continuant consonants and (most) monophthongal vowels: short, mid-long, and long.

  – Mid-long quantity not phonemic for vowels; may be considered an allophone of either long or short (but ambiguous which).

  – Contrast between mid-long and long consonants being lost in spoken language in certain positions (Türk et al 2015).

    ⬩ Not (yet?) standard; ignored in this presentation.

- All other consonants contrast a short vs. long degree.

- Diphthongs and consonant clusters: short vs. long.

Quantity

- Standard orthography mostly distinguishes two degrees.
    - Single letter = short phoneme: *na* /na/ 'well' (interjection)
    - Doubled letter = long phoneme: *naa* /nā/ 'yes, yeah; indeed'
    - Mid-long phonemes written the same as short ones: *kove* /kòvè/ ~ /kovè/
    - Diphthong and consonant cluster length not indicated.

- Precision diacritics used in this presentation[1]:
    - Dot below = mid-long consonant: *sääṇi* 'word'
    - Grave = mid-long latus vowel: *koṿè* 'picture'
        - Not used before coda /j/ (sources disagree; length neutralized?)
    - Preceding apostrophe = short consonant cluster: *aʼmè* 'sky.GEN.SG'
        - Not used after long vowels; clusters always short in this position (?)
    - Breve on first element = short diphthong: *vy̆elgiđ* 'leave'

[1]) Modified from Sammallahti & Morottaja 1993

Terminology and Notation

jävri
'lake'

- First-syllable vowel = Vowel Center (VC)
- Consonant(s) in coda of 1st & onset of 2nd syllable = Consonant Center (CC)
- Second-syllable vowel = Latus

- The quantitative degree of the consonant center is denoted with a Roman numeral: from shortest to longest, Q_I, Q_{II}, Q_{III}.
- Q_I only exists for sonorants; short obstruents represent Q_{II}!
- Long clusters represent Q_{III}, short ones Q_{II}.

Key Observations

- Grades distinguished mainly by quantity.

- Only 2 distinct quantities for obstruents & clusters; 3 for sonorants.

- *Shortened* and *lengthened* grades distinct only where qualitative differences appear between strong and weak.
  - But: *shortening type* (ST) - short vowel center regardless of grade, occurs by default when an ending adds one or more syllables to word.

- Qualitative differences between grades only appear for a relatively small number of consonants.

Stem Types

- Disyllabic stems
  - Reflect basic Proto-Saamic stem type; most common vocabulary
  - Divided into subtypes based on *stem vowel* (typically latus in citation form)
  - Most morphophonological alternation; topic of this presentation

- Other stem types:
  - Trisyllabic: Less complex alternation; typically two stem allomorphs
  - Tetrasyllabic: Resemble bisyllabic words; somewhat less complex
  - Contracted: Either no consonant alternation at all, or roughly similar to trisyllabic words

Disyllabic Nouns

- NOM.SG ends in a vowel (usually the stem vowel)
  - May be any monophthongal vowel; *a* and *á* rare, but do exist.[1]

- Three main types of quantity alternation:
  1) Binary gradation with vowel length alternation in VC (*â-, u-, i-* & *á*-stems)
  2) Binary gradation with vowel length alternation in latus (*o-, a-, á-*)
  3) Ternary gradation (*â-, u-, i-, o-*)

- Other, rarer types also exist, but are mostly outside the scope of this presentation.

- Qualitative gradation to be dealt with separately.

- Disyllabic adjectives outside the scope of this presentation, but largely follow same rules.

[1] Omitted by mistake from abstract of this presentation - as noted by keen-eyed anonymous reviewer - but mentioned previously in Koukkari 2020.

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Disyllabic Nouns: Type 1

- Stem vowel *â*, *i*, *u* or, in bright-vocalic words, *á*.

- NOM.SG has Q$_{III}$.
  - *cŭoppâ* 'fish meat'
  - *áldu* 'reindeer cow'
  - *kÿermi* 'load'
  - *hĭärrá* 'lord'

- Alternation Q$_{III}$: Q$_{II}$
  - Short vowel center before Q$_{III}$ and in ST, long otherwise.

SG					
NOM	cŭoppâ	áldu	kÿermi	hĭärrá	vQ$_{III}$ʋ
GEN	cuopâ	ááldu	kyermi	hiäṛá	v̄Q$_{II}$ʋ
ACC	cuopâ	ááldu	kyermi	hiäṛá	v̄Q$_{II}$ʋ
ILL	cuopân	ááldun	kuármán	hiäṛán	v̄Q$_{II}$ʋ*n*
LOC	cuopâst	ááldust	kyermist	hiäṛást	v̄Q$_{II}$ʋ*st*
COM	cŭoppáin	áldoin	kŭormi̯n	hĭärráin	vQ$_{III}$ʋ*i̯n*
ABE	cŭopâttáá	álduttáá	kÿeṛmittáá	hĭäṛáttáá	vQ$_{II}$ʋ*ttáá*
ESS	cŭoppân	áldun	kÿermin	hĭärrán	vQ$_{III}$ʋ*n*
PART	cŭoppâd	áldud	kÿermid	hĭärrád	vQ$_{III}$ʋ*d*
PL					
NOM	cuopah	áálduh	kyermih	hiäṛáh	v̄Q$_{II}$ʋ*h*
GEN	cuopâi	ááldui	kuormi̯	hiäṛái	v̄Q$_{II}$ʋ*i̯*
ACC	cuopâid	áálduid	kuormi̯d	hiäṛáid	v̄Q$_{II}$ʋ*i̯d*
ILL	cŭoppáid	áldoid	kŭormi̯d	hĭärráid	vQ$_{III}$ʋ*i̯d*
LOC	cuopâin	áálduin	kuormi̯n	hiäṛáin	v̄Q$_{II}$ʋ*i̯n*
COM	cŭopâigijn	álduigijn	kŭoṛmi̯gijn	hĭäṛáigijn	vQ$_{II}$ʋ*i̯gijn*
ABE	cŭopâittáá	álduittáá	kŭoṛmi̯ttáá	hĭäṛáittáá	vQ$_{II}$ʋ*i̯ttáá*

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Disyllabic Nouns: Type 2

- Stem vowel *o, a*[1] or, in *dark-vocalic* words, *á*.

- NOM.SG has Q_{III}.

  mušto 'memory'
  pirrá 'spinning top'
  teltta 'tent'

- Alternation Q_{III} : Q_{II}

  - Short latus in NOM.SG, ESS & PART; long in LOC.SG; mid-long following Q_{II}.

    - Ambiguous where followed by /j/.

  - Exception: ILL.SG has long VC and short latus.

    [1]) Often in loans, not all of which conform regularly to this type.

SG				
NOM	mušto	pìrrá	teltta	vQ�têʋ
GEN	mùštò	pịṛà	teˀltà	vQᴍʋ̀
ACC	mùštò	pịṛà	teˀltà	vQᴍʋ̀
ILL	muušton	piiṛán	teeltan	v̄Qᴍʋn
LOC	muštoost	pìrráást	telttaast	vQᴍ ̄ʋst
COM	muštoin	pìrráin	telttain	vQᴍʋin
ABE	mùštòttáá	piṛàttáá	teˀltàttáá	vQᴍʋ̀ttáá
ESS	mušton	pìrrán	telttan	vQᴍʋn
PART	muštod	pìrrád	telttad	vQᴍʋd
PL				
NOM	mùštòh	piṛàh	teˀltàh	vQᴍʋ̀h
GEN	mùštoi	piṛái	teˀltai	vQᴍʋi̯
ACC	muštoid	pìrráid	telttaid	vQᴍʋi̯d
ILL	muštoid	pìrráid	telttaid	vQᴍʋi̯d
LOC	muštoin	pìrráin	telttain	vQᴍʋi̯n
COM	muštoigijn	piṛáigijn	teˀltaigijn	vQᴍʋigijn
ABE	mùštoittáá	piṛáittáá	teˀltaittáá	vQᴍʋi̯ttáá

Disyllabic Nouns: Type 3

- Stem vowel *â, u, i* or *o*.
- NOM.SG has Q_{II}.

  kieḷâ 'tongue, language'
  tááḷu 'house, building'
  sääṇi 'word'
  piṇò 'pile, heap'

- Alternation $Q_{III} : Q_{II} : Q_I$
  - o-stems: latus long after Q_{III}, both vowels in LOC.SG.
  - Otherwise no vowel length alternation, apart from ST.

SG					
NOM	kieḷâ	siäḷu	sääṇi	piṇò	$\sqrt{}Q_{II}\upsilon$
GEN	*kielâ*	*siälu*	*sääni*	*pinò*	$\sqrt{}Q_{I}\upsilon$
ACC	*kielâ*	*siälu*	*sääni*	*pinò*	$\sqrt{}Q_{I}\upsilon$
ILL	kieḷân	siäḷun	sááṇán	piṇòn	$\sqrt{}Q_{II}\upsilon n$
LOC	*kielâst*	*siälust*	*säänist*	*piinoost*	$\breve{\sqrt{}}Q_{I}\breve{\upsilon}st$
COM	*kieláin*	*siäloin*	*saanijn*	*pinoin*	$\sqrt{}Q_{I}\upsilon in$
ABE	*kĭelâttáá*	*sĭäluttáá*	*sänittáá*	*pinottáá*	$\breve{\sqrt{}}Q_{I}uttáá$
ESS	**kiellân**	**siällun**	**säännin**	**pinnoon**	$\sqrt{}Q_{III}\breve{\upsilon}n$
PART	**kiellâd**	**siällud**	**säännid**	**pinnood**	$\sqrt{}Q_{III}\breve{\upsilon}d$
PL					
NOM	*kielah*	*siäluh*	*säänih*	*pinòh*	$\sqrt{}Q_{I}\upsilon h$
GEN	*kielâi*	*siälui*	*saanij*	*pinoi*	$\sqrt{}Q_{I}\upsilon i$
ACC	*kielâid*	*siäluid*	*saanijd*	*pinoid*	$\sqrt{}Q_{I}\upsilon id$
ILL	*kieláid*	*siäloid*	*saanijd*	*pinoid*	$\sqrt{}Q_{I}\upsilon id$
LOC	*kielâin*	*siäluin*	*saanijn*	*pinoin*	$\sqrt{}Q_{I}\upsilon in$
COM	*kĭelâigijn*	*sĭäluigijn*	*sanijgijn*	*pinoigijn*	$\breve{\sqrt{}}Q_{I}\upsilon igijn$
ABE	*kĭelâittáá*	*sĭäluittáá*	*sanijttáá*	*pinoittáá*	$\breve{\sqrt{}}Q_{I}\upsilon ittáá$

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Disyllabic Nouns: e-stems

- Stem-final *e* alternates with *i*, with effects on gradation.
  - *alme* 'sky'
  - *koʋè* 'picture'

- Mixed gradation:
  - SG forms & NOM.PL: same quantity structure as o-stems
    - Q_{III} in NOM.SG > type 2
    - Q_{II} in NOM.SG > type 3
  - Oblique PL:
    - Q_{III} in NOM.SG > as type 1
    - Q_{II} in NOM.SG > VC lengthened, except in ST.

SG					
NOM	**alme**	**vQ_ⅢƱ**		koʋè	vQ_Ⅱ ù
GEN	aⅼmè	vQ_Ⅱ ù		*koʋè*	vQ_Ⅰ ù
ACC	aⅼmè	vQ_Ⅱ ù		*koʋè*	vQ_Ⅰ ù
ILL	aalm<u>a</u>n	v̄Q_Ⅱ Ʊn		koʋ̀a̋n	vQ_Ⅱ ùn
LOC	**almeest**	**vQ_Ⅲ ūst**		*kooveest*	v̄Q_Ⅰ ūst
COM	<u>o</u>lmijn	vQ_Ⅲ Ʊ*i̯n*		*kuuvijn*	v̄Q_Ⅰ ʋ*i̯n*
ABE	aⅼmèttáá	vQ_Ⅱ ù*ttáá*		*koʋèttáá*	vQ_Ⅰ ùttáá
ESS	**almen**	**vQ_Ⅲ Ʊn**		**koʋeen**	**vQ_Ⅲ ūn**
PART	**almed**	**vQ_Ⅲ Ʊd**		**koʋeed**	**vQ_Ⅲ ūd**
PL					
NOM	aⅼmèh	vQ_Ⅱ ùh		*koʋèh*	vQ_Ⅰ ùh
GEN	<u>oo</u>lmij	v̄Q_Ⅱ Ʊ*i̯*		*kuuvij*	v̄Q_Ⅰ ʋ*i̯*
ACC	<u>oo</u>lmijd	v̄Q_Ⅱ Ʊ*i̯d*		*kuuvijd*	v̄Q_Ⅰ ʋ*i̯d*
ILL	**<u>o</u>lmi̯jd**	**vQ_Ⅲ Ʊ*i̯d***		*kuuvijd*	v̄Q_Ⅰ ʋ*i̯d*
LOC	<u>oo</u>lmijn	v̄Q_Ⅱ Ʊ*i̯n*		*kuuvijn*	v̄Q_Ⅰ ʋ*i̯n*
COM	oⅼmijgijn	vQ_Ⅱ Ʊ*i̯gijn*		*kuvijgijn*	vQ_Ⅰ ʋ*i̯gijn*
ABE	oⅼmijttáá	vQ_Ⅱ Ʊ*i̯ttáá*		*kuvijttáá*	vQ_Ⅰ ʋ*i̯ttáá*

Disyllabic Nouns: Possessive Forms

- Nouns may be declined to indicate the person (but not number!) of a possessor: *hĭärrám* 'my/our lord', *hĭärrád* 'your lord', *hĭärrás* 'their lord'

- Much less commonly used than the absolute declension; this account based on rules given by Itkonen (1991) and Morottaja & Olthuis (2022).

- Same gradation types as in abs. declension may be distinguished.

- More extensive syncretism: in addition to GEN.SG & ACC.SG, GEN.PL, ACC.PL & ILL.PL as well as COM.SG & LOC.PL merge in all types.
  - NOM.PL not in use (Itkonen 1991).

- ABE & COM.PL formed by attaching *-ttáá* or *-gijn*, respectively, to corresponding GEN.

hiäṛád 'of your lord'
  hiäṛádttáá 'without your lord'
hĭäṛáidis 'of their lords'
  hĭäṛáidisgijn 'with their lords'
  hĭäṛáidisttáá 'without their lords'

Disyllabic Nouns: Type 1, Poss.

- Gradation Q$_{III}$: Q$_{II}$
  - Vowel lengthening only in GEN/ACC.SG 2nd & 3rd person.
  - Note lack of ST in ILL.SG & ESS.

- 2nd person forms, where not otherwise indicated, may be formed by replacing the *-n* of the corresponding 1st person form with *-d.*

  hĭäṛástân 'from my/our lord'
  hĭäṛástâd 'from your lord'

SG						
NOM	1st	cŭoppâm	áldum	kŭármám	hĭärrám	vQ$_{III}$ʋm
	2nd	cŭoppâd	áldud	kŭármád	hĭärrád	vQ$_{III}$ʋd
	3rd	cŭoppâs	áldus	kỹermis	hĭärrás	vQ$_{III}$ʋs
GEN/ACC	1st	cŭoppân	áldun	kŭármán	hĭärrán	vQ$_{III}$ʋn
	2nd	cuopâd	ááldud	kuármád	hiäṛád	v̄Q$_{II}$ʋd
	3rd	cuopâs	ááldus	kyermis	hiäṛás	v̄Q$_{II}$ʋs
ILL	1st	cŭoppâsân	áldusân	kŭármásân	hĭärrásân	vQ$_{III}$ʋsân
	3rd	cŭoppâsis	áldusis	kŭármásis	hĭärrásis	vQ$_{III}$ʋsis
LOC	1st	cŭopâstân	áldustân	kỹeŕmistân	hĭäṛástân	vQ$_{II}$ʋstân
	3rd	cŭopâstis	áldustis	kỹeŕmistis	hĭäṛástis	vQ$_{II}$ʋstis
COM	1st	cŭopâinân	álduinân	kŭoŕmijnân	hĭäṛáinân	vQ$_{II}$ʋi̯nân
	3rd	cŭopâinis	álduidis	kŭoŕmijnis	hĭäṛáinis	vQ$_{II}$ʋi̯dis
ESS	1st	cŭoppânân	áldunân	kỹerminân	hĭärránân	vQ$_{III}$ʋnân
	3rd	cŭoppânis	áldunis	kỹerminis	hĭärránis	vQ$_{III}$ʋnis
PL						
GEN/ACC/ILL	1st	cŭopâidâd	álduidân	kŭoŕmijdân	hĭäṛáidân	vQ$_{II}$ʋi̯nân
	3rd	cŭopâidis	álduidis	kŭoŕmijdis	hĭäṛáidis	vQ$_{II}$ʋi̯dis

Disyllabic Nouns: Type 2, Poss.

- Gradation $Q_{III} : Q_{II}$
  - Latus long in GEN/ACC.SG 2nd & 3rd person, mid-long in LOC.SG.
  - Note lack of ST in ILL.SG & ESS.

- 2nd person forms, where not otherwise indicated, may be formed by replacing the *-n* of the corresponding 1st person form with *-d.*

  teɫtàstân 'in my/our tent'
  teɫtàstâd 'in your tent'

SG					
NOM	1st	muštom	pirrám	telttam	vQ̫ʋ*m*
	2nd	muštod	pirrád	telttad	vQ̫ʋ*d*
	3rd	muštos	pirrás	telttas	vQ̫ʋ*s*
GEN/ACC	1st	mušton	pirrán	telttan	vQ̫ʋ*n*
	2nd	muštood	pirráád	telttaad	vQ̫ū*d*
	3rd	muštoos	pirráás	telttaas	vQ̫ū*s*
ILL	1st	muštosân	pirrásân	telttasân	vQ̫ʋ*sân*
	3rd	muštosis	pirrásis	telttasis	vQ̫ʋ*sis*
LOC	1st	muštòstân	piṛàstân	teɫtàstân	vQ̫ù*stân*
	3rd	muštòstis	piṛàstis	teɫtàstis	vQ̫ù*stis*
COM	1st	muštoinân	piṛáinân	teltainân	vQ̫ʋi̭*nân*
	3rd	muštoinis	piṛáinis	teltainis	vQ̫ʋi̭*dis*
ESS	1st	muštonân	pirránân	telttanân	vQ̫ʋ*nân*
	3rd	muštonis	pirránis	telttanis	vQ̫ʋ*nis*
PL					
GEN/ACC/ILL	1st	muštoidân	piṛáidân	teltaidân	vQ̫ʋi̭*nân*
	3rd	muštoidis	piṛáidis	teltaidis	vQ̫ʋi̭*dis*

Disyllabic Nouns: Type 3, Poss.

- Gradation $Q_{III} : Q_{II} : Q_I$
  - o-stems: Latus long after Q_{III} and GEN/ACC.SG 2ⁿᵈ & 3ʳᵈ person, mid-long in LOC.SG.
  - Otherwise no vowel length alternation, apart from ST.
  - Note presence of ST in ILL.SG & ESS.

- 2ⁿᵈ person forms, where not otherwise indicated, may be formed by replacing the *-n* of the corresponding 1ˢᵗ person form with *-d.*

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SG						
NOM	1ˢᵗ	kìellâm	táállum	sáánnám	pìnnoom	vQₗₗₗᵤ*m*
	2ⁿᵈ	kìellâd	táállud	sáánnád	pìnnood	vQₗₗᵤ*d*
	3ʳᵈ	kìellâs	táállus	sää, nnis	pìnnoos	vQₗₗᵤ*s*
GEN/ACC	1ˢᵗ	kìellân	táállun	sáánnán	pìnnoon	vQₗₗᵤ*n*
	2ⁿᵈ	kielâd	táálud	sáánád	piinood	v̄Qₗₗᵤ*d*
	3ʳᵈ	kielâs	táálus	sääni s	piinoos	v̄Qₗₗᵤ*s*
ILL	1ˢᵗ	kĭel̦âsân	tál̦usân	sánásân	piņòsân	vQₗₗᵤ*sân*
	3ʳᵈ	kĭel̦âsis	tál̦usis	sáņásis	piņòsis	vQₗₗᵤ*sis*
LOC	1ˢᵗ	kĭelâstân	tálustân	sänistân	piņòstân	vQₗₗᵤ*stân*
	3ʳᵈ	kĭelâstis	tálustis	sänistis	piņòstis	vQₗₗᵤ*stis*
COM	1ˢᵗ	kĭelâinân	táluinân	saņijnân	pinoinân	vQₗₗᵤi̦*nân*
	3ʳᵈ	kĭelâinis	táluinis	saņijnis	pinoinis	vQₗₗᵤi̦*dis*
ESS	1ˢᵗ	kĭel̦ânân	tál̦unân	säņinân	piņònân	vQₗₗₗᵤ*nân*
	3ʳᵈ	kĭel̦ânis	tál̦unis	säņinis	piņònis	vQₗₗᵤ*nis*
PL						
GEN/ACC/ILL	1ˢᵗ	kĭelâidân	táluidân	saņijdân	pinoidân	vQₗₗᵤi̦*nân*
	3ʳᵈ	kĭelâidis	táluidis	saņijdis	pinoidis	vQₗₗᵤi̦*dis*

Disyllabic Verbs

- INF ends in stem vowel + *đ*
  - *a-* and *á*-stem disyllabic verbs do not exist.

- Two main types of quantitative alternation: binary & ternary.
  - The grade of the CC in a form does not depend on the stem vowel.
  - Qualitative gradation to be dealt with separately.

- INF always has Q_{III}.
  - Binary gradation if both vowels are short
  - Ternary gradation if either VC or latus is long.

- Possible subgrouping based on form of PRS.3SG:
  1) Ends in -*á*, bright VC
  2) Ends in -*a* or -*á*, dark VC
  3) Bare stem of verb (ends in *o* or *u*)

Disyllabic Verbs: Binary, Subtype 1

- i-stems, â-stems with bright VC in PRS.3SG.
  - *vy̆elgiđ* 'leave'
  - *pallâđ* 'be warm enough'

- Gradation Q$_{III}$: Q$_{II}$
  - Long VC before Q$_{II}$.

	PRS		PST	
1SG	paaḷâm	vuálgám	**pallim**	**vŭolgìm**
2SG	paaḷah	vuálgáh	**pallih**	**vŭolgih**
3SG	**páⅼlá**	**vŭálgá**	paaḷâi	vuolgij
1DU	**pälleen**	vy̆elgeen	**pallâim**	**vŭolgìjm**
2DU	**pallâvettee**	**vy̆elgivettee**	**palláid**	**vŭolgijd**
3DU	**pallâv**	**vy̆elgiv**	**palláin**	**vŭolgìjn**
1PL	**pallâp**	**vy̆elgip**	paaḷâim	vuolgijm
2PL	**pallâvetteđ**	**vy̆elgivetteđ**	paaḷâid	vuolgijd
3PL	**pällih**	**vy̆elgih**	**pallii**	**vŭolgìi**
CNG	paaḷâ	vyelgi	**koddám**	**čulgâm**
	IMP		COND	
3SG	páálus	vuálgus	paḷâččij	vŭálgàččij
3PL	**pállus**	**vŭálgus**	paḷâččii	vŭálgàččii

Disyllabic Verbs: Binary, Subtype 2

- e-stems, â-stems with dark VC in PRS.3SG.
  - *čulgâđ* 'spit'
  - *koddeđ* 'kill'

- Gradation Q_{III} : Q_{II}
  - Long VC in PST forms with Q_{II}.
  - â-stems: long VC in PRS.1SG, 2SG & CNG.
  - Otherwise short VC, mid-long latus with Q_{II}.

	PRS			PST	
1SG	čuulgâm	kodám		čulgim	kuddim
2SG	čuulgah	kodảh		čulgih	kuddih
3SG	čolgá	koddá		čuulgâi	kuudij
1DU	čolgeen	koddeen		čulgáim	kuddijm
2DU	čulgâvettee	koddevettee		čulgáid	kuddijd
3DU	čulgâv	koddev		čulgáin	kuddijn
1PL	čulgâp	koddep		čuulgâim	kuudijm
2PL	čulgâvetteđ	koddevetteđ		čuulgâid	kuudijd
3PL	čolgeh	koddeh		čulgii	kuddii
CNG	čuulgâ	kodè		čulgâm	koddám
	IMP			**COND**	
3SG	čolgòs	kodòs		čulgâččij	kodảččij
3PL	čolgoos	koddoos		čulgâččii	kodảččij

Disyllabic Verbs: Binary, Subtype 3

- u-stems, o-stems
  áiguđ 'intend'
  oskođ 'believe'

- Gradation Q$_{III}$: Q$_{II}$
  - VC long in u-stems before Q$_{II}$.
  - o-stems do not feature VC lengthening; latus mid-long after Q$_{II}$.

	PRS			PST	
1SG	áaigum	o̕skòm		aigum	uskum
2SG	áaiguh	o̕skòh		aiguh	uskuh
3SG	**áigu**	**osko**		áaigui	o̕skoi
1DU	**áigoon**	**oskoon**		**áigoim**	**oskoim**
2DU	**áiguvettee**	**oskovettee**		**áigoid**	**oskoid**
3DU	**áiguv**	**oskov**		**áigoin**	**oskoin**
1PL	**áigup**	**oskop**		áaiguim	o̕skoim
2PL	**áiguvetteđ**	**oskovetteđ**		áaiguid	o̕skoid
3PL	**áiguh**	**oskoh**		aiguu	uskuu
CNG	áaigu	o̕skò		**áigum**	**oskom**
	IMP			**COND**	
3SG	áaigus	o̕skòs		áiguččij	o̕skòččij
3PL	**áigus**	**oskoos**		áiguččii	o̕skòččii

Disyllabic Verbs: Ternary, Subtype 1

- e-stems, â-stems with bright VC in PRS.3SG.
  - *faallâđ* 'offer'
  - *čäälliđ* 'write'

- Gradation Q$_{III}$: Q$_{II}$: Q$_I$
  - INF stem in PRS.3DU, PRS.1PL & PTCP.PST.
  - Short VC in PST.3PL.
  - i-stems: short VC, mid-long latus in PRS.1SG & 2SG.
  - Long VC in all other forms, except in ST.

	PRS			PST	
1SG	*faalâm*	*čálàm*		**faallim**	**čaallim**
2SG	*faalah*	*čálàh*		**faallih**	**čaallih**
3SG	fáálá	čáálá		*faalâi*	*čaalij*
1DU	**fälleen**	**čälleen**		*faaláim*	*čaalijm*
2DU	*faḷâvettee*	*čäḷivettee*		*faaláid*	*čaalijd*
3DU	**faallâv**	**čäälliv**		*faaláin*	*čaalijn*
1PL	**faallâp**	**čäällip**		*faalâim*	*čaalijm*
2PL	*faḷâvetteđ*	*čäḷivetteđ*		*faalâid*	*čaalijd*
3PL	fääḷih	čääḷih		**fallii**	**čallii**
CNG	*faalâ*	*čääli*		**faallâm**	**čáállám**
	IMP			COND	
3SG	*fáálus*	*čáálus*		*falâččij*	*čálàččij*
3PL	**fáállus**	**čáállus**		*falâččii*	*čálàččii*

Disyllabic Verbs: Ternary, Subtype 2

- e-stems, â-stems with dark VC in PRS.3SG.

  moonnâđ 'go'

  kođđeeđ 'knit, weave'

- Gradation Q$_{III}$: Q$_{II}$: Q$_I$

  - INF stem in PRS.3DU, PRS.1PL & PTCP.PST.
  - Long VC in all PST forms except 3PL.
  - â-stems: long VC in PRS.1SG, 2SG & CNG.
  - Short VC and short (â) or mid-long latus elsewhere.

	PRS			**PST**	
1SG	*moonâm*	*kođåm*		**moonnìm**	**kuuđđịm**
2SG	*moonah*	*kođåh*		**moonnìh**	**kuuđđịh**
3SG	*maṇà*	*kođå̀*		*moonâi*	*kuuđij*
1DU	**manneen**	**kođđeen**		*moonáim*	*kuuđijm*
2DU	*moṇâvettee*	*kođèvettee*		*moonáid*	*kuuđijd*
3DU	**moonnâv**	**kođđeev**		*moonáin*	*kuuđijn*
1PL	**moonnâp**	**kođđeep**		*moonâim*	*kuuđijm*
2PL	*moṇâvetteđ*	*kođèvetteđ*		*moonâid*	*kuuđijd*
3PL	*maṇèh*	*kođèh*		**monnịi**	**kuđđịi**
CNG	*moonâ*	*kođè*		**moonnâm**	**kođđáám**
	IMP			**COND**	
3SG	*maṇòs*	*kođòs*		*monâččij*	*kođåččij*
3PL	**mannoos**	**kođđoos**		*monâččii*	*kođåččii*

Disyllabic Verbs: Ternary, Subtype 3

- u-stems, o-stems
  kuárruđ 'sew'
  orroođ 'be, stay, dwell'

- Gradation Q_{III} : Q_{II} : Q_I
  - INF stem in PRS.3DU, PRS.1PL & PTCP.PST.
  - Short VC in PST.3PL.
  - Long VC in PST.1SG & 2SG.
  - Long VC in u-stems before Q_{II} & Q_{II}.
  - o-stems do not feature VC lengthening; latus mid-long after Q_{II}.

	PRS			PST	
1SG	*kuárum*	*oròm*		**koorrum**	**uurrum**
2SG	*kuáruh*	*oròh*		**koorruh**	**uurruh**
3SG	kuáṛu	oṛò		*kuárui*	*oroi*
1DU	**kŭáŕroon**	**orroon**		*kuáŗoim*	*oroim*
2DU	kŭáṛuvettee	oṛòvettee		*kuáŗoid*	*oroid*
3DU	**kuáŕruv**	**orroov**		*kuáŗoin*	*oroin*
1PL	**kuáŕrup**	**orroop**		*kuáruim*	*oroim*
2PL	kŭáṛuvetteđ	oṛòvetteđ		*kuáruid*	*oroid*
3PL	kuáṛuh	oṛòh		**korruu**	**urruu**
CNG	*kuáru*	*oṛò*		**kuáŕrum**	**orroom**
	IMP			**COND**	
3SG	*kuárus*	*oròs*		*kŭáruččij*	*oròččij*
3PL	**kuáŕrus**	**orroos**		*kŭáručči i*	*oròččii*

Qualitative Gradation

- Qualitative differences between grades only appear in historically short unvoiced stops & affricates.

  - Exception: the sound change */k/ > /h/ also affects the weak grade of the historical geminate /kk/:
  ákku (< *ākkō) 'grandmother' : *ááhu*

  lyepi (< *lōpē) 'lamina' GEN.SG *lǔeve*
  kietâ (< *kētę) 'hand' : *kieđâ*
  juuhâ (< *jokę) 'river' : *juuṿâ*
  čääci (< *čācē) 'water' : *čääsi*
  eeči (< *ęčē) 'father' : *eeji*

  - Also used to occur in sibilants (cf. Itkonen 1971), but this has been lost.

- The *strong grade* retains the original stop or affricate, while the *weak* is a fricative or an approximant.

- The pairs *p ~ v* & *t ~ đ* feature ternary gradation, with the weak grade in Q_I.

- In the pairs *h ~ ɣ*, *c ~ s*, *č ~ j* & *kk ~ h,* neither consonant represents Q_I; these feature *complex gradation*.

Qualitative Gradation: *p* & *t*, Nouns

- Disyllabic nouns with single *p* or *t* in CC in NOM.SG belong to type 3.

  - Weak grade in Q_I.

    kietâ 'hand; arm'
    liäpu 'rest'
    tääpi 'manner'
    ito 'sprout'

SG					
NOM	kietâ	liäpu	tääpi	itò	$vQ_{II}ʊ$
GEN	*kieđâ*	*liävu*	*täävi*	*iđò*	$vQ_Iʊ$
ACC	*kieđâ*	*liävu*	*täävi*	*iđò*	$vQ_Iʊ$
ILL	kietân	liäpun	táápán	itòn	$vQ_{II}ʊn$
LOC	*kieđâst*	*liävust*	*täävist*	*iiđoost*	$v̆Q_Iʊ̆st$
COM	*kieđáin*	*liävoin*	*taavijn*	*iđoin*	$vQ_Iʊin$
ABE	*kĭeđâttáá*	*lĭävuttáá*	*tävittáá*	*iđòttáá*	$v̆Q_Iʊttáá$
ESS	**kiettân**	**liäppun**	**tääppin**	**ittoon**	$vQ_{III}ʊ̆n$
PART	**kiettâd**	**liäppud**	**tääppid**	**ittood**	$vQ_{III}ʊ̆d$
PL					
NOM	*kieđah*	*liävuh*	*täävih*	*iđòh*	$vQ_Iʊh$
GEN	*kieđâi*	*liävui*	*taavij*	*iđoi*	$vQ_Iʊi̯$
ACC	*kieđâid*	*liävuid*	*taavijd*	*iđoid*	$vQ_Iʊi̯d$
ILL	*kieđáid*	*liävoid*	*taavijd*	*iđoid*	$vQ_Iʊi̯d$
LOC	*kieđâin*	*liävuin*	*taavijn*	*iđoin*	$vQ_Iʊin$
COM	*kĭeđâigijn*	*lĭävuigijn*	*tavijgijn*	*iđoigijn*	$v̆Q_Iʊi̯gijn$
ABE	*kĭeđâittáá*	*lĭävuittáá*	*tavijttáá*	*iđoittáá*	$v̆Q_Iʊi̯ttáá$

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Qualitative Gradation: *p* & *t*, Nouns

- Cf. type-3 nouns without qualitative gradation.

SG					
NOM	kie̬l̬â	siä̬l̬u	sää̬n̬i	piṇò	˅Qₗₗʋ
GEN	kielâ	siälu	sääni	pinò	˅Qₗʋ
ACC	kielâ	siälu	sääni	pinò	˅Qₗʋ
ILL	kie̬l̬ân	siä̬l̬un	sáá̱ṇ̱án	piṇòn	˅Qₗₗʋ*n*
LOC	kielâst	siälust	säänist	piinoost	˅̆Qₗʋ̆*st*
COM	kieláin	siäloin	saanijn	pinoin	˅Qₗʋi̱*n*
ABE	ki̯elâttáá	si̯äluttáá	sänittáá	pinottáá	ʋ̆Qₗʋ*ttáá*
ESS	ki̯ellân	siällun	säännin	pinnoon	˅Qₗₗₗʋ̆*n*
PART	ki̯ellâd	siällud	säännid	pinnood	˅Qₗₗₗʋ̆*d*
PL					
NOM	kielah	siäluh	säänih	pinòh	˅Qₗʋ*h*
GEN	kielâi	siälui	saanij	pinoi	˅Qₗʋi̱
ACC	kielâid	siäluid	saanijd	pinoid	˅Qₗʋi̱*d*
ILL	kieláid	siäloid	saanijd	pinoid	˅Qₗʋi̱*d*
LOC	kielâin	siäluin	saanijn	pinoin	˅Qₗʋi̱*n*
COM	ki̯elâigijn	si̯äluigijn	sanijgijn	pinoigijn	ʋ̆Qₗʋi̱*gijn*
ABE	ki̯elâittáá	si̯äluittáá	sanijttáá	pinoittáá	ʋ̆Qₗʋi̱*ttáá*

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Qualitative Gradation: *p* & *t*, Verbs

- Disyllabic verbs with ternary gradation and *p* or *t* in CC in INF are inflected like other verbs with ternary gradation.
  - Weak grade in Q_I.

    sooppâđ 'agree; fit'
    puáttiđ 'come'

	PRS		PST	
1SG	*soovâm*	*pŭáđàm*	**sooppim**	**poottim**
2SG	*soovah*	*pŭáđàh*	**sooppih**	**poottih**
3SG	suápá	puátá	*soovâi*	*poođij*
1DU	**suáppeen**	**puátteen**	*soováim*	*poođijm*
2DU	sopâvettee	pŭátivettee	*soováid*	*poođijd*
3DU	**sooppâv**	**puáttiv**	*soováin*	*poođijn*
1PL	**sooppâp**	**puáttip**	*soovâim*	*poođijm*
2PL	sopâvetteđ	pŭátivetteđ	*soovâid*	*poođijd*
3PL	suápih	puátih	**soppìì**	**pottìì**
CNG	*soovâ*	*puáđi*	**sooppâm**	**puáttám**

	IMP		COND	
3SG	*suávus*	*puáđus*	*sovâččij*	*pŭáđàččij*
3PL	**suáppus**	**puáttus**	*sovâččii*	*pŭáđàččii*

Qualitative Gradation: *p* & *t*, Verbs

- Cf. subtype-1 verbs with ternary alternation without qualitative gradation.

	PRS		PST	
1SG	*faalâm*	*čálàm*	**faallim**	**čaallim**
2SG	*faalah*	*čálàh*	**faallih**	**čaallih**
3SG	fáálá	čáálá	*faalâi*	*čaalij*
1DU	**fälleen**	**čälleen**	*faaláim*	*čaalijm*
2DU	faḷâvettee	čäḷivettee	*faaláid*	*čaalijd*
3DU	**faallâv**	**čäälliv**	*faaláin*	*čaalijn*
1PL	**faallâp**	**čäällip**	*faalâim*	*čaalijm*
2PL	faḷâvetteđ	čäḷivetteđ	*faalâid*	*čaalijd*
3PL	fääḷih	čääḷih	**fallìi**	**čallìi**
CNG	*faalâ*	*čääli*	**faallâm**	**čáállám**
	IMP		COND	
3SG	*fáálus*	*čáálus*	*falâččij*	*čálàččij*
3PL	**fáállus**	**čáállus**	*falâččii*	*čálàččii*

Complex Gradation

- Concerns the alternating pairs *h ~ ɣ, c ~ s* & *č ~ j̭*, as well as *k(k) ~ h*.

- Exhibit a form of binary gradation; quantity is either Q_{III} or Q_{II}.
  - Prototypically Q_{II} (except for *kk*, which is Q_{III}), but both members of each pair may be lengthened to Q_{III}, i.e. geminated.

- Disyllabic nouns with complex gradation and stem vowel *â*, *i*, or *u* (or *á*) appear to follow the quantity structures of type 1.
  - o-stems either type 2 or mixed 2/3 (?).

- Disyllabic verbs with complex gradation are grouped with ternary gradation (or rather, II : I) by Morottaja & Olthuis (2022), but quantities do not always appear to match.

- Further research required.

Complex Gradation: Nouns

- CC *c, č, h*, or *kk* in NOM.SG.
- Stem vowel *â, i, u* or, in bright-vocalic words, *á*;
  - *muocâ* 'moth'
  - *ákku* 'grandmother'
  - *eeči* 'father'
  - *čiähá* 'hiding place, cache'

- Weak grade in all forms except NOM.SG, ILL.SG, ESS & PART.

- Quantities as in type 1, apart from NOM.SG.
  - Note retention of vowel length in ESS & PART.

SG					
NOM	muocâ	**ákku**	eeči	čiähá	
GEN	muosâ	ááhu	eeji	čiav̦á	v̄Qⅱʊ
ACC	muosâ	ááhu	eeji	čiav̦á	v̄Qⅱʊ
ILL	muocân	áákun	iáčán	čiähán	v̄Qⅱʊn
LOC	muosâst	ááhust	eejist	čiav̦ást	v̄Qⅱʊst
COM	**mŭossáin**	**áhhoin**	**eijijn**	**čǐav̦v̦áin**	**v̌Qⅲʊin**
ABE	mŭosâttáá	áhuttáá	ejittáá	čǐav̦áttáá	v̌Qⅱʊttáá
ESS	**muoccân**	**ákkun**	**eeččin**	**čiähhán**	**vQⅲʊn**
PART	**muoccâd**	**ákkud**	**eeččid**	**čiähhád**	**vQⅲʊd**

PL					
NOM	muosah	ááhuh	eejih	čiav̦áh	v̄Qⅱʊh
GEN	muosâi	ááhui	eejij	čiav̦ái	v̄Qⅱʊi
ACC	muosâid	ááhuid	eejijd	čiav̦áid	v̄Qⅱʊid
ILL	**mŭossáid**	**áhhoid**	**eijijd**	**čǐav̦v̦áìd**	**v̌Qⅲʊid**
LOC	muosâin	ááhuin	eejijn	čiav̦áin	v̄Qⅱʊin
COM	mŭosâigijn	áhuigijn	ejijgijn	čiav̦áigijn	v̌Qⅱʊigijn
ABE	mŭosâittáá	áhuittáá	ejijttáá	čǐav̦áittáá	v̌Qⅱʊittáá

Complex Gradation: Nouns

- Cf. type-1 nouns without qualitative gradation.

SG					
NOM	cǔoppâ	áldu	ky̌ermì	hǐärrá	vQⅲʋ
GEN	cuopâ	ááldu	kyermi	hiäṛá	v̄Qⅲʋ
ACC	cuopâ	ááldu	kyermi	hiäṛá	v̄Qⅲʋ
ILL	cuopân	ááldun	kuármán	hiäṛán	v̄Qⅲʋn
LOC	cuopâst	ááldust	kyermist	hiäṛást	v̄Qⅲʋst
COM	cǔoppáin	áldoin	kǔormijn	hǐärráin	vQⅲʋin
ABE	cǔopâttáá	álduttáá	ky̌eṛmittáá	hǐäṛáttáá	vQⅲʋttáá
ESS	cǔoppân	áldun	ky̌ermin	hǐärrán	vQⅲʋn
PART	cǔoppâd	áldud	ky̌ermid	hǐärrád	vQⅲʋd
PL					
NOM	cuopah	áálduh	kyermih	hiäṛáh	v̄Qⅲʋh
GEN	cuopâi	ááldui	kuormij	hiäṛái	v̄Qⅲʋi
ACC	cuopâid	áálduid	kuormijd	hiäṛáid	v̄Qⅲʋid
ILL	cǔoppáid	áldoid	kǔormijd	hǐärráid	vQⅲʋid
LOC	cuopâin	áálduin	kuormijn	hiäṛáin	v̄Qⅲʋin
COM	cǔopâigijn	álduigijn	kǔoṛmijgijn	hǐäṛáigijn	vQⅲʋigijn
ABE	cǔopâittáá	álduittáá	kǔoṛmijttáá	hǐäṛáittáá	vQⅲʋittáá

Concluding Remarks

- Consonant gradation in AS can be mostly described in terms of quantitative alternation only.
  - Two main types: *binary* & *ternary*.

- Disyllabic words can be divided into a number of inflection classes based on the paradigmatic quantitative alternation they exhibit.

- Qualitative alternation only concerns a limited number of consonants.
  - *Ternary* or *complex* gradation.
  - Words exhibiting these can at least fairly often be classified into the same quantitative alternation classes as other words.

- Each inflection class can be described in relatively simple terms on its own, but the number of classes can get quite large.
  - Simpler description overall? Probably a matter of taste, but perhaps the elephant is easier to eat if divided into smaller parts.

Takkâ!

https://github.com/tkoukkar/anaraskiela/

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