

Tonal reduction and prosodic restructuring in Somali nominals*

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1 Introduction

It is uncontroversial that the Somali tonal system has stress-like properties:

- No more than one High tone can occur per Phonological Word (PWord).
- The position of High tones is, roughly, demarcative: they occur on either the penult or final syllable of a PWord.
(See, e.g., Hyman 1981, 2006, 2016; Green & Morrison 2016, Le Gac 2003.)
- Only some proper names have a High tone in another position. (Saeed 1999: 22)

How to account for these generalizations is more controversial. Some possibilities:

- underlying accent (Banti 1988, Green & Morrison 2016, Le Gac 2003);
- (underlying) High tone (Andrzejewski 1964, 1979, 1981; Armstrong 1934; Hyman 2006, 2016; Le Gac 2016);
- no underlying tone or accent; rather surface tone is the result of morphological tone/accent assignment principles (Hyman 1981, Mous 2009).

Addressing this problem is outside the scope of this particular talk.

- However, we do assume that Somali is a tonal language, not an (underlyingly) accentual one.

Our topic of investigation for today is,

- To document which morphemes or morphological constructions contribute a High tone to some nominal constructions.
- In the spirit of Green & Morrison (2016; G&M), **we aim to account for** the position and number of High tones that occur within these constructions in terms of
 - **matches and mismatches** between morphosyntactic structure and prosodic structure.

Outline of the talk:

- in section 2, we show that a number of Somali nominal constructions in our corpus do not have the tone pattern expected from the previous literature. One of the expected High tones is ‘missing’.
- in section 3, we argue that familiar tone or intonation processes like
 - the OCP or
 - Final Lowering (a process well-documented for Somali)do not plausibly account for the tone patterns we find.
- in section 4, we propose that **prosodic restructuring** provides a better account,
 - and we draw a parallel with prosodic adjunction processes that have been motivated for Swedish (a language with a surprising number of prosodic properties in common with Somali).

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2 Data to be accounted for

This talk presents preliminary results of a study of the prosody of some nominal constructions, based on recently collected elicitation data.

We begin by summarizing the expected tone patterns for the data we investigated. Then we present the tone patterns attested (with more information about our corpus).

2.1 Expected High tones in (non-subject) nominal constructions from the literature

We briefly summarize the sources of High tones expected in (non-subject) nominal constructions, based mainly on Hyman (1981), Saeed (1993, 1999) and G&M.

All nouns in isolation have a High tone on either the penult or the final syllable. The position **is determined by morphological factors** (e.g., declension class; ‘gender’; singular vs. plural)

- **not phonological factors.**

We give a few examples in (1); note that compounds have a single High tone, on either the penult or the final syllable:

(1) Somali nominals

(a) tonal minimal pairs

ínan ‘boy’ vs. inán ‘girl’
béer ‘liver’ vs. beér ‘garden’
éy ‘dog’ vs. eý ‘dogs’

(b) tone on penult vs. ultima in words of identical phonological form

dukáan ‘shop’
caleén ‘leaf’
sonkór ‘sugar’
kibís ‘bread’
súbag ‘butter’
mindí ‘knife’
gúri ‘house’

(c) compounds

dayaxgacméed ‘satellite’ (cf. dáyx ‘moon’; gacméed ‘of hands’)
lacagháye ‘cashier’ (cf. lacág ‘money’; hay- ‘have, hold’; -e agentive)
caanagéel ‘camel milk’ (cf. caanó ‘milk’; géel ‘camels’)
madaxweýne ‘president’ (cf. mádax ‘head’; wéyn ‘big’)

Nouns can be followed by a number of determiners. As shown in the list in (2), while the definite determiner is toneless, **the other determiners introduce a High tone:**

(2) Somali determiner types (Saeed 1999: 111-117); **k/g/h** vs. **t/d/sh** distinction determined by gender agreement

- a. Definite ka/ta
- b. Remote definite kií/tíí
- c. Interrogative keé/teé
- d. Possessives káyga/táyda ‘my’, káaga/táada ‘your (sg.)’, kíisa/tíisa ‘his’, kéeda/téeda ‘her’, kayága/tayáada ‘our (excl.)’, kéenna/téenna ‘our (incl.)’, kíinna/tíinna ‘your (pl.)’, kóoda/tóoda ‘their’
- e. Demonstrative kán/tán, kaás/taás, keér/teér, koó/toó

Note that:

- the **High-toned determiners (i.e., (2b-e)) are expected to retain their High tone** in combination with a noun according to work like: G&M, Saeed (1993, 1999).
 - While Hyman (1981: 191) mentions a process of accent reduction on possessive determiners following a noun, only an example or two is provided.
- None of the determiners change the tone of the base noun, except *-keé/-teé* ‘which?’ - (3h-i)

(3) Somali nouns with determiners (Saeed 1993: 160-168)

- a. nín ‘man’ nín-ka ‘the man’
- b. naág ‘woman’ naág-ta ‘the woman’
- c. nín ‘man’ nín-kán ‘this man’
- d. naág ‘woman’ naág-tán ‘this woman’
- e. sáddex ‘three’ sáddex-daás ‘those three’
- f. shúqul ‘work’ shúqul-káyga ‘my work’
- g. lacág ‘money’ lacág-táada ‘your money’
- h. nín ‘man’ nin-keé ‘which man?’
- i. naág ‘woman’ naag-teé ‘which woman?’

Work like (G&M, Hyman 1981, Saeed 1993) observes that a High tone is realized, not only on many postnominal determiners, but also on the modifier in a noun+modifier phrase.

- As shown in (4), in an N+modifier phrase **a High tone is expected to be assigned on the final vowel¹ of the (indefinite) modifier**, while the modified noun keeps its base High tone pattern.
 - Note that numbers are considered nouns, and they head N+modifier phrases.

(4) Somali noun+modifier phrases (Hyman 1981; G&M; our elicitation notes)

- a. géed wííl ‘a tree of a boy’ (cf. wííl ‘boy’)
- b. áfar búug ‘four books’ (cf. búug ‘book’)
- c. gaarí cusúb ‘a new car’
- d. shúqul adág ‘hard work’
- e. gacán-ta midíg ‘the right hand’ (cf. midíg ‘right side’)
- f. labó sabuurad-oód ‘two blackboards’ (cf. sabuurád ‘blackboard’)
- g. mindí-da Maxaméd ‘the knife of Maxamed’ (cf. Maxámed)

¹ Only a few adjectives, e.g., *dhéer* ‘long’, *wéyn* ‘big’ (Saeed 1999: 105-106), and some female proper names seem to constitute exceptions.

In sum, many nominal constructions are expected to have **two High tones**:

- one on the noun
- one on the following determiner or modifier (noun or adjective)

In keeping with the **one High tone per Prosodic Word** principle, G&M propose that the postnominal determiners and modifiers which surface with a High tone are parsed as independent PWords from the Noun they modify.

- As a result, N+determiner (H-toned) and N+modifier have the same prosodic parse.

The representations in (5) adapt G&M’s analysis; surface High-toned morphemes are **bolded**:

(5) Prosodic structures for Somali nominals; parentheses indicate PWords (adapting G&M)

- | | |
|--------------------------|--|
| a. N+definite | ((N) def) _{PWord} |
| b. compound | ((N) _{PWord} (N) _{PWord}) _{PWord} |
| c. N+H-toned determiners | (N) _{PWord} (Det) _{PWord} |
| d. N+modifier | (N) _{PWord} (Modif) _{PWord} |

Notice the parallelism in the structure of N+Determiner (5c) and N+Modifier (5d).

2.2 Our data

The new data discussed here were collected in 2016 through elicitation, working mainly with one speaker from Kismayo and two speakers from Mogadishu. The overall corpus comprises 10,002 utterances (tokens) representing 2,970 types.

What we find in our data is that the nominal constructions in (5c, d) do not consistently have the High tone patterns expected:

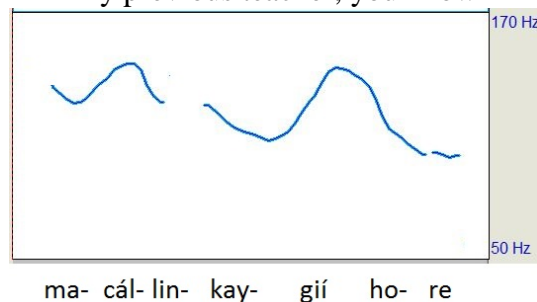
- The High tone on the determiner or nominal modifier is often ‘missing’.

For example, the possessive determiner is seldom realized with its expected High tone. In our data it is missing in 87% of a total of 1,068 instances.²

(6)

- | | | |
|-----------------------------------|--|----------------|
| a. biyá-hayga | ‘my water’ | (~ biyá-háyga) |
| b. dhég-tiisa | ‘his ear’ | (~ dhég-tíisa) |
| c. macállin- kay -gií hore | ‘my previous teacher, you know’ (teacher-my-remote definite) | |

Figure 1. A typical possessive:
macállinkaygií hore instead of the expected *macállinkáygií horé*
 ‘my previous teacher, you know’



² Constructions containing the shorter (indefinite) possessive suffixes have been excluded.

The demonstrative suffixes also often lack a High tone (missing in 58% of the 635 instances in our data), whereas the remote definite suffix more often realizes its High tone (missing only in 36% of the 997 instances³ in our data).

Modifier constructions (noun+indefinite noun and noun+adjective) should have a High tone assigned to the final syllable of the second word.

Yet, in our data, this High tone is missing in 68% of the 571 instances of N+N constructions and in 50% of the 599 instances of N+Adj constructions in our data:

- (7)
- | | | | |
|-------------------|--------------------------|--------------------|------------------------------------|
| a. háł litír | ‘one liter’ | (~ háł litír) | (NB: numbers are nouns in Somali.) |
| b. gúri-ga Muuse | ‘Musa’s house’ | (~ gúri-ga Muusé) | |
| c. biyó badan | ‘much water’ | (~ biyó badán) | |
| d. subáx-díí hore | ‘(in) the early morning’ | (~ subáx-díí horé) | |

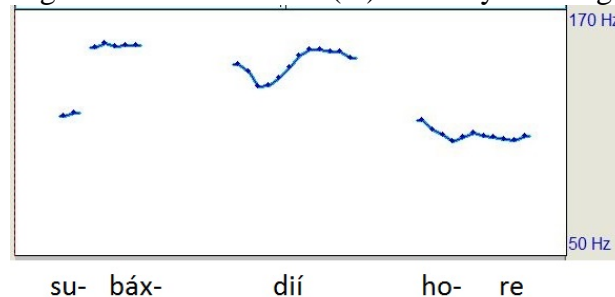
3 Why OCP and Final Lowering cannot account for this pattern

3.1 OCP

Looking at Figure 1, above, one might propose that the High tone on the determiner is deleted as an OCP effect (Leben 1973). However, OCP is not a general principle of the Somali tone system.

When two consecutive High tones occur, they are generally on almost the same pitch level:

Figure 2. *subáxdíí hore* ‘(in) the early morning’



Furthermore, the OCP is not relevant in the case of the missing High tones in Noun-modifier constructions, such as *hore* ‘early’ in this example.

3.2 Final Lowering

The Somali tone literature (Andrejewski 1981, Hyman 1981, Saeed 1993, 1999) notes that High tones are lowered phrase-finally/pre-pausally.

- Since the ‘missing’ High tones in our data often occur in phrase-final position, the first account that comes to mind is that Final Lowering is responsible.

In this section, we argue, though, that Final Lowering cannot account for the missing High tones in our data.

First, the expected High tone on the possessive (e.g., *dhég-tíisa* ‘his ear’) is not associated with the final syllable, so final tone lowering is not relevant here.

³ Remote definite suffixes in non-focused subject NP’s have been excluded.

Second, final High tones are not deleted in our data in other morphosyntactic contexts:

(8) Words in isolation

- a. tukayaál ‘crows’ (*tukayaal)
- b. ubaxyó ‘flowers’
- c. lafdhabarró ‘spines’

(9) Sentence final position

- a. Wáxaan arkay ratí. ‘I saw a camel.’ (cf. ratí ‘camel’)
- b. Má aragtay macállin-kay-gíí? ‘Did you see my teacher?’
- c. Waxaan lá kulmay Sahró. ‘I met with Sahra.’
- d. Wáa sheeka-deé? ‘Which story is it?’ (cf. sheéko ‘story’)

That is, final High tones are not systematically deleted.

Third, High tones can be deleted from the word-final syllable of a determiner or a modifier even when the word is not phrase-final/pre-pausal.

(10)

- a. labá dúmar ah oo qurúx badan oo kalíya ‘just two beautiful women’
(cf. labá ‘two’; dúmar ‘women’; qurúx ‘beauty’; badán ‘much’; kalíya ‘only’)
- b. sánnad-kíi hore ~ sánnad-kíí hore ‘last year’ (cf. sánnad ‘year’; horé ‘previous’)
- c. bisád-daas yar ~ bisád-daás yar ‘that little cat’ (cf. bisád ‘cat’; yár ‘small’)

To sum up:

- High tone deletion/non-realization appears to be construction specific.
- High tones are often deleted when the context for neither the OCP or Final Lowering is met.

4 Prosodic restructuring

4.1 Parallel with Swedish prosodic adjunction

Coming from a Swedish background, one is struck by the similarities between the prosodic systems of Somali and Swedish, another language with a stress-like tone system.

As argued for in recent work by Riad (2012, 2016) and Myrberg & Riad (2015), in Swedish we find:

- culminativity of stress at the PWord_{min} level and culminativity of tone at the PWord_{max} level;
- compounds are a single tone realization/assignment domain;
- some affixes are stressed, while others are not.

Some Swedish examples illustrating these properties:

(11) Culminativity in Swedish prosody (Myrberg & Riad 2015)

a. PWord culminativity for stress and tone

(3) *American English and Swedish stress*

(¹mone,tary)_ω (mone¹tär)_ω^{min=max}
 (to,tali'tarian)_ω (totali'tär)_ω^{min=max}
 ('ab,stract)_ω (ab'strakt)_ω^{min=max}

(4) *German and Swedish stress*

(₁mili,tari'sieren)_ω (militari'sera)_ω^{min=max}
 (çono,matopo'etisch)_ω (onomatopo'etisk)_ω^{min=max}
 (uni,versi'tät)_ω (universi'tet)_ω^{min=max}

b. compounds (and compound-like words) have two stresses but are a single tonal accent domain (accent 2)

(15) *Postlexical accent 2 (several stresses)*

a. sommar-lov ²((¹sommar₂)_ω^{min} (₁lov)_ω^{min})_ω^{max} 'summer break' compound
 jul-lovs-morgon ²((¹jul)_ω^{min} (₁lov-s)_ω^{min} (₁morgon₂)_ω^{min})_ω^{max} 'Christmas break morning'
 b. tvätt-bar ²((¹tvätt)_ω^{min} (₁bar)_ω^{min})_ω^{max} 'washable' tonic suffix
 grym-het ²((¹grym)_ω^{min} (₁het)_ω^{min})_ω^{max} 'cruelty'
 c. på-laga ²((¹på)_ω^{min} (₁lag-a₂)_ω^{min})_ω^{max} 'tax; duty' tonic prefix
 o-nödig ²((¹o)_ω^{min} (₁nöd-ig₂)_ω^{min})_ω^{max} 'unnecessary'

c. affixes which add a stress/tone vs. ones that do not

(¹moder)_ω^{min} (₁skap)_ω^{min})_ω^{max} 'motherhood'
 ((¹an)_ω^{min} (₁komma)_ω^{min})_ω^{max} 'arrive'
 (för-(¹ändra)_ω^{min})_ω^{max} 'to change'

All of these properties also characterize Somali, as we have seen in the preceding section. The following table summarizes these similarities.

(12) Comparison of the prosody of Swedish and Somali

	Somali	Swedish
a. PWord culminativity	√ - tone	√ - stress (PWord _{min}); tonal accent (PWord _{max})
b. compounds are 1 tone realization domain	√	√
c. stressable/tone bearing affixes?	√	√

Most striking, as work like Garlén (1988), as well as Riad (2016) and Myrberg & Riad (2015) report,

- short phrases, sometimes even similar in meaning to those in our Somali data, are variably parsed into a single tone/stress realization domain:

Some examples:

(13) Prosodic restructuring in Swedish (Myrberg & Riad 2015)

Prosodic adjunction in morphology and syntax

a. morphology: för-²(¹tal-a₂) (för-¹(¹tal-a₂)_ω)_ω^{max} 'to slander', see (16c)
 b. syntax: för ²(¹liten₂) (för ¹(¹liten₂)_ω)_ω^{max} 'too small'
 för ²(¹mång-a₂) (för ¹(¹mång-a₂)_ω)_ω^{max} 'too many'
 för ²(¹länge₂) (för ¹(¹länge₂)_ω)_ω^{max} 'too long'

Lexicalized phrases with prosodic adjunction

- a. ((röd-a₂)_ω ²(matt-an₂)_ω)_ω^{max} ‘red carpet’ (lexicalized phrase)
- b. ((Röd-a₂)_ω ¹(Kors-et)_ω)_ω^{max} ‘Red Cross’ (name, also lexicalized)
- c. ((hopp-a₂)_ω ¹(upp)_ω)_ω^{max} ‘jump up’ (particle verb)
- d. ((hel-a₂)_ω (lång-a₂)_ω ¹(dag-en)_ω)_ω^{max} ‘all day, lit. whole long day’

Analysis by Riad (2016) and Myrberg & Riad (2015):

- Both words and affixes can be incorporated into PWord(max) via prosodic restructuring/adjunction.
- This accounts for the tonal reduction found, given the one tonal accent per PWord(max) principle.

4.2 Our proposal

What we propose is that Somali High tone reduction is the result of prosodic restructuring, analogous to what has been proposed for Swedish by Riad (2016) and Myrberg & Riad (2015).

As G&M argue, for High-toned determiners like the possessive to be realized with a High tone, they must be parsed in a separate minimal PWord from the noun they modify, to maintain the one High tone per PWord principle. However, they must be parsed in the same PWord-max domain, because they undergo segmental sandhi processes, which do not apply across PWord-max boundaries:

(14)

- a. ((dhég)_{PWord-min} (tíisa)_{PWord-min})_{PWord-max} ‘his ear’
- b. ((mindí)_{PWord-min} (díisa)_{PWord-min})_{PWord-max} ‘his knife’

In the variable pronunciation where the possessive, for example, has lost its High tone, we propose that:

- the construction has the same recursive PWord structure as the toneless definite determiner – cf. (5a).
- That is, the construction has undergone prosodic restructuring:

(15)

- a. ((dhég)_{PWord-min} ta)_{PWord-max} ‘the ear’
- b. ((dhég)_{PWord-min} tiisa)_{PWord-max} ‘his ear’

Similarly, we propose that noun+modifier phrases that have ‘lost’ the High tone on the modifier have undergone prosodic restructuring, but they are parsed into a different prosodic domain – a Complex Word Group (cf. Vigário 2010; Vogel 2010):

(16) ((hál)_{PWord-max} litir)_{CWG} ‘one liter’

It is interesting to note that tonal reduction results in a High tone on the leftmost word of the noun+modifier construction, whereas compounding typically results in a single High tone on the rightmost word.

(17)

- | | |
|----------------------------------|--|
| a. madax-weýn-e (m.) ‘president’ | (cf. mádax (m.) ‘head’; wéyn ‘big’; -e agentive suff.) |
| b. cod-kác (m.) ‘tonal accent’ | (cf. cód (m.) ‘voice’; kac- ‘rise’) |
| c. biya-dhác (m.) ‘waterfall’ | (cf. biyó (pl.) ‘water’; dhac- ‘fall’) |
| d. bad-wéyn (f.) ‘ocean’ | (cf. bád (f.) ‘sea’; wéyn ‘big’) |
| e. magaala-mádax (f.) ‘capital’ | (cf. magaálo (f.) ‘town’; mádax (m.) ‘head’) |
| f. laf-dhábar (f.) ‘spine’ | (cf. láf (f.) bone; dhábar (m.) ‘back’) |

We conclude that these two constructions must have a different prosodic parse:

(18)

- | | | |
|----------------------|---|-------------|
| prosodic adjunction: | ((hál) _{PWord-max} litir) _{CWG} | ‘one liter’ |
| vs. | | |
| compound: | (madax(weýne) _{PWord-max}) _{CWG} | ‘president’ |

This is again analogous to Swedish, which only allows one tonal accent to be assigned to a compound or compound-like construction.

- For Somali, we propose that the High tone assigned to a CWG is realized on the internal PWord_{max}.

It is interesting to note that compounds and N+N phrases are distinguished by tone. As shown in (20), N+N constructions can have two High tones, while compounds only have one:

(19)

- | | |
|----------------------------|---|
| a. guri-márti ‘guesthouse’ | gúri martí ‘guests’ house’ (cf. gúri ‘house’; martí ‘guests’) |
| | ~ gúri marti |
| b. caana-géel ‘camel milk’ | caanó géel ‘camels’ milk’ (cf. caanó ‘milk’; géel ‘camels’) |
| | ~ caanó geel |

However, the N+N constructions can reduce the High tone on the second half, whereas compounds have a stable High tone.

One last point in favor of our analysis is that it accounts for the fact that determiners are added only to the rightmost word in a compound, whereas each noun in an N+N construction can have a determiner. In that case, though, the High tone of the second noun cannot reduce:

(20)

- | | |
|-----------------------------------|--------------------------------------|
| a. guri-márti-ga ‘the guesthouse’ | gúri-ga martí-da ‘the guests’ house’ |
| b. caana-géel-a ‘the camel milk’ | caaná-ha géel-a ‘the camels’ milk’ |

We propose that this is because compounds can contain only one PWord-max, whereas each noun in an N+N construction must be a PWord-max when it is followed by a determiner.

5 Conclusion and topics for future research

- Many nominal constructions in Somali do not realize the expected High tones on the determiner or modifier; that is, they undergo tonal reduction.
- We argue that tonal reduction in Somali is the consequence of prosodic restructuring.
- Prosodic restructuring in Somali closely parallels prosodic restructuring in Swedish, and so appears to be typical of these kinds of tonal systems (i.e., with tonal culminativity within a prosodic domain).
- Questions for future research: are High tones (or accents) underlying? Or are they assigned to PWord min (with access somehow to morphosyntactic information à la Hyman)?

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Selected References

- Andrzejewski, B. W. 1964. The declensions of Somali nouns. London: SOAS.
- Andrzejewski, B. W. 1979. The case system in Somali. London: SOAS.
- Andrzejewski, B. W. 1981. Tone in Somali. ms. SOAS, London.
- Armstrong, Liliias E. 1934. *The Phonetic Structure of Somali*. Republished 1964. Ridgewood, NJ: Gregg Press Inc.
- Banti, Giorgio. 1988. Two Cushitic systems: Somali and Oromo nouns. In H. van der Hulst & N. Smith (eds.), *Autosegmental Studies on Pitch Accent*. Dordrecht: Foris, 11-50.
- Downing, Laura J. 2010. Accent in African languages. In Harry G. van der Hulst, Rob W.N. Goedemans & Ellen A. van Zanten (eds.), *A Survey of Word Accentual Patterns in the Languages of the World*. Berlin: Mouton de Gruyter, 381-427.
- Garlén, Claes. 1988. *Svenskans fonologi*. Studentlitteratur AB.
- Green, Christopher R. & Michelle E. Morrison. 2016. Somali wordhood and its relationship to prosodic structure. *Morphology* 26, 3-32.
- Hyman, Larry M. 1981. Tonal accent in Somali. *Studies in African Linguistics* 12, 169-203.
- Hyman, Larry M. 2006. Word prosodic typology. *Phonology* 23, 225-257.
- Hyman, Larry M. 2012. In defense of prosodic typology. *Linguistic Typology* 16, 341-385.
- Le Gac, David. 2003. Tonal alternations in Somali. In Jacqueline Lecarme (ed.), *Research in Afroasiatic Grammar II*. Amsterdam: John Benjamins.
- Le Gac, David. 2016. Somali as a tone language. Presented at the Workshop on Approches sociolinguistique et linguistique des langues de Mayotte et Djibouti, Université de Rouen, 19 January 2016.
- Mous, Maarten. 2009. The typology of tone in Cushitic. WOCAL 6, Cologne, 16-21 August 2009.
- Myrberg, Sara & Tomas Riad. 2015. The prosodic hierarchy of Swedish. *Nordic Journal of Linguistics* 38, 115-147.
- Riad, Tomas. 2012. Culminativity, stress and tone accent in Central Swedish. *Lingua* 122, 1352-1379.
- Riad, Tomas. 2016. Underpinnings of prosodic grouping in Swedish. Paper presented at, Word order variation at the interfaces, Ben-Gurion University of the Negev, 13-15 November 2016.
- Saeed, John Ibrahim. 1993. *Somali Reference Grammar*. 2nd revised ed. Kensington, MD: Dunwoody Press.
- Saeed, John Ibrahim. 1999. *Somali*. Amsterdam: John Benjamins.
- Vigário, Marina. 2010. Prosodic structure between the prosodic word and the phonological phrase: Recursive nodes or an independent domain? *The Linguistic Review* 27, 485-530.
- Vogel, Irene. 2010. The phonology of compounds. In Sergio Scalise & Irene Vogel (eds.), *Cross-disciplinary Issues in Compounding*. Amsterdam: John Benjamins, 145-163.