There is no 'one High tone per word' rule in Somali

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Abstract This chapter argues that there is no one High tone per word rule in Somali, contrary to what is previously proposed. Previous definitions of the "word" in Somali are demonstrated to be circular: no other phonological processes reference the domain defined by the proposed one High tone per word rule. It is argued that without independent evidence of this domain, it is impossible to validate this rule by native data alone. Instead, one needs to investigate its productivity. Novel data is presented, demonstrating that the one High tone per word rule does not extend to loanwords and therefore is not productive. Hence this proposed rule fails to capture speakers' intuitions, and the circularity the rule introduces is a result of failing to tease apart synchronic and diachronic factors. The chapter concludes with the broader point that it is unnecessary to propose synchronic accounts for phenomena that are not synchronically productive.

Keywords Somali, tone, culminativity, wordhood, productivity, loanword adaptation

1 Background

The first to propose that Somali has tone, was Armstrong (1934), who carefully documented surface tone patterns in a number of Somali words and phrases. Klingenheben (1949) questioned whether Somali really has a tone system, and proposed that it is better analyzed as stress. 70 years later, scholars still disagree about how to characterize the prosodic system of Somali (e.g. Downing and Nilsson 2019; Green and Morrison 2016; Le Gac 2016, 2018). The disagreements revolve around certain properties of Somali prosody that give the impression of a system that lies "between" stress and tone (Hyman 2009). Such systems have been referred to as (pitch or tonal) *accent* systems, and are at the core of recent years' debates about prosodic typology (e.g. Hyman 2009; van der Hulst 2012; this volume).

What these accent systems have in common is that there are restrictions on the distribution of tonal contrasts. Such restrictions, or *accentual properties* of prosodic systems, include *obligatoriness* (minimum one tone per word), *culminativity* (maximum one tone per word), and *positional restrictions* (meaning that the distribution of the tone can be stated by referring to its position within a word, e.g. initially or finally) (Downing 2010; Hyman 2009, p. 220; van der Hulst this volume). Another property that is frequently cited is *privativity*, which is different from the others in that it does not make reference to a word domain: Rather, it involves analyzing a surface tone contrast (such as High versus Low) as the phonetic manifestation of an underlying contrast of presence versus absence of an accent. In the next section, we will briefly describe the prosodic system of Somali, and discuss to what extent the prosodic restrictions mentioned above are found in this system.

1.1 The prosodic system of Somali

In Hyman's (1981) seminal paper on tonal accent in Somali, he proposes that the tone-bearing unit in Somali is the mora, and that the contrast is between High-toned and Low-toned moras. A monomoraic syllable has either a High tone (marked here by an acute accent) or a Low tone (which is unmarked) (1), while bimoraic syllables have either a Low-High (rising) sequence of tones (sometimes simplified to a long High tone), High-Low (falling) tones, or only Low tones (2).

(1) **Monomoraic syllables** (Saeed 1999, p. 42)
   a. *kú* [kú] 'in, into'
   b. *ku* [kù] '2SG.OBJ'

(2) **Bimoraic syllables** (Saeed 1999, p. 20)
   a. *beér* [bĕ:r] ∼ [bé:r] 'garden'
   b. *béer* [bê:r] 'liver' (object case form)
   c. *beer* [bè:r] 'liver' (subject case form)

Hyman (1981) further argues that the system can be described by just referring to the High tone. Any mora that does not get a High tone, gets a Low tone. Because the Low tone is predictable, Hyman suggests that the contrast is *privative* (i.e. High-toned moras contrast with toneless moras, H vs. Ø – though see Le Gac 2016, 2018, who argues for a Low tone as well). He further proposes that the High tone is introduced via morphological rules. For example, masculine nouns typically have a High tone on the penultimate mora, and feminine nouns typically have a High tone on the final mora, as illustrated in (3)–(4).

(3) **Masculine nouns, penultimate H** (Hyman 1981, p. 172)

a. *ínan* ‘boy’

b. *qaálin* ‘young he-camel’

c. *daméer* ‘he-donkey’

(4) **Feminine nouns, final H** (Hyman 1981, p. 172)

a. *inán* ‘girl’

b. *qaalín* ‘young she-camel’

c. *dameér* ‘she-donkey’

As for the other accentual properties, *obligatoriness*, *culminativity*, and *positional restrictions*, the High tone is not obligatory: examples of words with only Low tones include *wada* ‘together’, *kala* ‘apart’, nouns in the nominative case (Saeed 1999, p. 44)[1] and verbs in the past simple and present general forms (Saeed 1999, pp. 79–103). However, it is generally assumed that the High tone is culminative (there is maximum one), and that there are positional restrictions on its distribution: No native roots have more than a single High tone, and it is usually restricted to the final or penultimate mora. This holds true for the nouns in (3)–(4), for example. However, as we will outline in the next section, the picture gets more complicated when considering polymorphemic words.

1.2 Tone patterns in polymorphemic words

Polymorphemic words in Somali have different tone patterns depending on the morphemes involved. In most cases, only the rightmost morpheme carries a High tone, illustrated with inflectional and derivational suffixation in (5), and compounding in (6) (see also Green and Morrison 2016, p. 15).

(5) **Suffixation**

a. *cód* ‘voice’ – *codád* ‘voices’

b. *bóqor* ‘king’ – *boqortoóyo* ‘kingdom’

(6) **Compounding**

a. *cód* ‘voice’ + *kár* ‘be able’ → *codkár* ‘orator’

b. *láf* ‘bone’ + *dhábar* ‘back’ → *lafdhábar* ‘spine’

As pointed out by Green and Morrison (2016, pp. 8–11), there is a set of morphemes that behave similarly from a grammatical viewpoint, yet show very different tonal

[1] Somali has a case system of the type *marked nominative*, which is common in Cushitic languages (Mous 2012).

patterns. The morphemes in question are determiners, namely interrogatives, definite articles, demonstratives and possessives, listed in (7) (see Saeed 1999, pp. 111–117 for full paradigms).

(7) **Determiners**

Interrogative	*keé/teé*
Non-remote definite article	*ka/ta*
Remote definite article	*kií/tií*
Demonstratives	*kán/tán* ‘this’, *kaás/taás* ‘that’, etc.
Possessives	*káyga/táyda* ‘my’, *kíisa/tíisa* ‘his’, *kayága/tayáda* ‘our’, etc.

Before turning to their tone patterns, we will briefly describe their similarities. First, they may all modify a head noun (e.g. *nín-**kií*** ‘the (remote) man’) or head a noun phrase (e.g. ***kií** kalé* ‘the other one’). They all show gender agreement with the noun they modify or stand for: Masculine forms have an initial [k] (e.g. *ínan-ka* ‘the boy’) and feminine forms an initial [t] (e.g. *inán-ta* ‘the girl’). When modifying a head noun, the initial segment of the determiner is subject to obligatory sandhi alternations. For example, the initial [k] in masculine determiners becomes voiced after [i], as illustrated with the interrogative determiner in (8) (see Saeed 1999, pp. 28–29 for the full set of sandhi rules).

(8) **Interrogative determiner**

a. *cód* + *keé* → *cod**k**eé* ‘which voice?’

b. *gúri* + *keé* → *gur**ig**eé* ‘which house?’

The determiners show different tonal behavior. When they head noun phrases, they have the patterns illustrated in (7) above. When used as modifiers of a noun, the following tone patterns occur: First, the example in (8) shows that when the interrogative determiner *keé/teé* follows a noun, the same pattern as in suffixation and compounding applies (see 5–6 above): The resulting form has one High tone, and it is realized on the rightmost morpheme, in this case the determiner (see also Saeed 1999, p. 114; Green and Morrison 2016, p. 16). Second, when the non-remote definite article *ka/ta* follows a noun, the resulting form has one High tone, but in this case, it is realized on the noun (9) (see also Saeed 1999, p. 112; Green and Morrison 2016, p. 9).

(9) **Definite article**

a. *cód* + *ka* → *códka* ‘the voice’

b. *gúri* + *ka* → *gúriga* ‘the house’

Third, when the remote definite article *kií/tií* follows a noun, the resulting form has *two* High tones, one on the stem, and one on the article (10). The same pattern is

found with demonstratives (11) and possessives (12) (see also Saeed 1999, pp. 112–117, Green and Morrison 2016, p. 10).[2]

(10) **Remote definite article**

a. *cód* + *kií* → *códkií* 'the (remote) voice'

b. *gúri* + *kií* → *gúrigií* 'the (remote) house'

(11) **Demonstratives**

a. *cód* + *kán* → *códkán* 'this voice'

b. *gúri* + *kán* → *gúrigán* 'this house'

(12) **Possessives**

a. *cód* + *káy* + *ka* → *códkáyga* 'my voice'

b. *gúri* + *káy* + *ka* → *gúrigáyga* 'my house'

In (12), the possessive determiner is suffixed with the definite article. In fact, possessives "occur with the full range of determiners, with associated meanings" (Saeed 1999, p. 115). When the second determiner carries a High tone, the resulting form has three High tones (13).

(13) **Three High tones**

a. *cód* + *káy* + *kán* → *códkáygán* 'this voice of mine'

b. *gúri* + *káy* + *kán* → *gúrigáygán* 'this house of mine'

There are thus three main tone patterns found in polymorphemic words in Somali, summarized in Table 1. In this table and the paper overall, data are transcribed using the Somali orthograhy[3] (with the additional feature of marking High tones), including the convention of spelling all of these constructions as single orthographic words.

Green and Morrison (2014) point out that "one tone per word is not enough" for a discussion of wordhood in Somali, and explore grammatical and prosodic phenomena with the aim of relating Somali to a larger typological picture concerning wordhood (e.g. Dixon and Aikhenvald 2002). In recent accounts of the tone patterns in Somali, Green and Morrison (2016) and Downing and Nilsson (2019) propose that forms like *códkií* and *gúrigáygán* in fact consist of multiple "prosodic words", due to the presence of multiple High tones. Their analyses are summarized in the next section.

[2]Downing and Nilsson (2019) report that the expected second High tone is optional or missing in some varieties of Somali. We do not aim to address these varieties here.

[3]The deviations between the orthographic symbols and the IPA symbols are as follows: *c* represents a voiced pharyngeal fricative [ʕ], *dh* is a retroflex stop [ɖ], *j* is a postalveolar affricate [tʃ], *kh* a uvular fricative [χ], *sh* a postalveolar fricative [ʃ], *x* a voiceless pharyngeal [ħ] or epiglottal fricative [ʜ], *y* is a palatal glide [j], and *'* is a glottal stop [ʔ].

High tone on rightmost morpheme				
Plural suffix	*cód* + *-áC*	→	**codád**	‘voices’
Compound	*cód* + *kár*	→	**codkár**	‘orator’
Interrogative	*cód* + *keé*	→	**codkeé**	‘which voice?’
High tone on noun, Low-toned determiner				
Definite article	*cód* + *ka*	→	**códka**	‘the voice’
High tone on noun, High tone on determiner(s)				
Remote definite article	*cód* + *kií*	→	**códkií**	‘the (remote) voice’
Demonstratives	*cód* + *kán*	→	**códkán**	‘this voice’
Possessives	*cód* + *káy* + *kií*	→	**códkáygií**	‘my (remote) voice’

Table 1: Tone patterns in Somali

1.3 Previous accounts and the concept ‘word’

Green and Morrison (2016) and Downing and Nilsson (2019) aim to account for the different tone patterns described in section 1.2 in terms of structural differences between the morphemes involved. Both works are couched within the Prosodic Hierarchy framework (e.g. Nespor and Vogel 1986; Selkirk 1984). While the details of the analyses differ, they are both based on the common assumption (following Hyman 1981; Le Gac 2002, 2003; Saeed 1999) that the High tone is culminative within the Prosodic Word (PWord) domain and that it can be used as a “diagnostic” for that domain.

Green and Morrison (2016) and Downing and Nilsson (2019) account for the tone patterns listed in Table 1 by proposing different prosodic structures for these constructions. When two morphemes are concatenated, and only one of them retains its High tone, that morpheme is analyzed as the prosodic head of the resulting construction: compare (14) and (15) (prosodic headedness is marked in boldface). Any construction that has two High tones is analyzed as consisting of two PWords, as in (16).

(14) **High tone on rightmost morpheme**
cód ‘voice’ + *kár* ‘be able’ → *codkár* ‘orator’
((cod)**(kár)**)$_{\text{PWord}}$

(15) **High tone on noun, Low-toned determiner**
cód + *ka* → *códka* ‘the voice’
(**(cód)**(ka))$_{\text{PWord}}$

(16) **High tone on noun, High tone on determiner**
cód + *kií* → *códkií* 'the (remote) voice'
(cód)$_{\text{PWord}}$(kií)$_{\text{PWord}}$

While Green and Morrison analyze the structure in (14) as PWord recursion or adjunction, and (15) as cliticization, to contrast them with (16), Downing and Nilsson propose a Complex Word Group domain for the structure in (14), and PWord recursion for (15) and (16) (see Green and Morrison 2016, pp. 11–26 and Downing and Nilsson 2019 for details). The differences reflect a difference in how the authors analyze the sandhi alternations that affect determiners. This point will be taken up again in section 2.2.

What the two accounts share, is that the High tone is used as a diagnostic for a word domain. However, there is no a priori reason to do so. Furthermore, the idea that a "word" can be assumed to exist in a language in the first place has been questioned: in recent years, there have been a number of typological works that aim to develop a non-aprioristic alternative to the Prosodic Hierarchy framework and to wordhood more generally (e.g. Bickel, Hildebrandt, and Schiering 2009; Bickel and Zúñiga 2017; Haspelmath 2011; Schiering, Bickel, and Hildebrandt 2010; Tallman 2020; Tallman et al. 2019; van Gijn and Zúñiga 2014). As Haspelmath puts it:

> The very search for a definition of the concept 'word' seems to be guided by the unstated presupposition that something like the word must exist in languages, just as it exists in alphabetic writing. But a scientific approach to language structure should imply that we do not take any traditional concept for granted, and that we posit only those categories that we can argue for in describing language structure (Haspelmath 2011, p. 71)

Tallman argues for reformulating the existence of grammatical and phonological words as "a testable empirical hypothesis, rather than as a terminological prescription" (Tallman 2020, p. 10). While the "word" arguably is a problematic *comparative concept* because it is defined based on language-particular criteria, it could be a useful *descriptive category* for unifying phenomena within a given language (see Haspelmath 2018 for more on the distinction). But in the next section, we will question the usefulness of the proposed "PWord" domain in Somali even as a language-particular category. We argue that there is no independent evidence of this proposed domain. Furthermore, previous accounts of the system only take parts of the picture into consideration, and will run into problems when considering more data. We will conclude that a new approach to the prosodic system of Somali is warranted.

2 Revisiting phonological processes in Somali

The problem with assuming a "one High tone per PWord" rule in Somali is that there is no way of knowing the number of PWords in a given construction without knowing the number of High tones. There is an inherent risk of circularity associated with the approach of defining prosodic domains by formulating rules that reference those very domains. Within the Prosodic Hierarchy theory, this problem is "generally overcome by establishing independent evidence for the constituent in question, in particular, other phenomena that apply in precisely the same domain" (Vogel 2009, p. 20).

To our knowledge, there are no other phenomena that apply within the PWord domain referenced by the proposed "one High tone per PWord" rule. In what follows, we will consider two potential candidates for such a process: syllable reduction and sandhi alternations. By providing novel analyses and perspectives on these processes, we illustrate that none of them line up with the proposed PWord domain, and in fact, attempts to analyze these processes in terms of phonological domains lead to further analytical issues.

2.1 Syllable reduction

If there is a process that applies between a noun and an affix, after any and all affixation, but is blocked at a noun-determiner boundary, this could indicate that there is a domain boundary between the noun and the determiner. If such a process exists in Somali, this could indeed be independent evidence of a PWord domain referenced by a *one High tone per PWord* rule. One of the candidates for such a process is what Green and Morrison (2018, p. 215) call *syllable reduction*. Green and Morrison propose that syllable reduction is triggered by affixes (e.g. the plural suffix *-ó*, as in *jiríd* 'trunk' → *jird-ó* 'trunks'), but is blocked at the noun-determiner boundary (e.g. *jiríd-da* 'the trunk'). If this were the case, the process of syllable reduction could potentially provide independent evidence of a PWord domain. However, we will show that the relevant process only occurs when the suffix is vowel-initial (e.g. plural *-ó*), and therefore, the lack of syllable reduction in noun-determiner constructions follows from the fact that determiners are consonant-initial. Hence no appeal to the "PWord" is necessary, and a closer look at the data in fact reveals that an approach based on prosodic domains would fail to account for all the data.

Consider the examples in (17)–(18). The nouns in (17) exhibit vowel-zero alternations (e.g. *ílig – ilkó*), and the nouns in (18) exhibit vowel-glide alternations (e.g. *béri – beryó* [berjó]).

(17) **Vowel-zero alternations**

		SG	SG.DEF	PL	PL.DEF
a.	'tooth'	*ílig*	*íligga*	*ilkó*	*ilkáha*
b.	'trunk, stem'	*jiríd*	*jirídda*	*jirdó*	*jirdáha*

(18) **Vowel-glide alternations**

		SG	SG.DEF	PL	PL.DEF
a.	'day'	*béri*	*bériga*	*beryó*	*beryáha*
b.	'house'	*gúri*	*gúriga*	*guryó*	*guryáha*

Green and Morrison (2018) take the position that the alternations in (17) and (18) are the result of the same process, which they call *syllable reduction*. The relationship they propose between this process and wordhood is captured in the following quote:

> **Proposed relationship to wordhood**
>
> Syllable reduction (...) is a word-level process in that it occurs only after any and all affixation (...) Compare, for example, the outcome of syllable reduction in *ílig* 'tooth' vs. *ilkó* 'teeth', **ilikó*, and *béri* 'day' vs. *beryó* 'days', **beriyó*. In both instances, syllable reduction occurs following pluralization. (Green and Morrison 2018, p. 226)

The plural marker *-ó* is analyzed as a suffix, creating a recursive PWord with the noun stem, which is the proposed domain for both syllable reduction (hence the vowel-glide alternation between *béri* and *beryó* in (18a)) and culminativity (maximum one High tone per PWord, hence the rightwards tonal shift from *béri* to *beryó*). However, if one wants to make the case that syllable reduction only applies within the PWord domain, the argumentation should not just be based on forms where syllable reduction applies, but also on forms where the process does *not* apply. That is, it seems to us that the key to this proposal lies not in the form *beryó* itself, but in the comparison between *beryó* and *bériga*. Although Green and Morrison do not spell this out, our interpretation of the proposal is that the reason why *bériga* does not reduce to **bérga*, is that the definite article *-ga* is a clitic, and not a suffix. The representations of the two forms are illustrated in (19) (adapted from Green and Morrison 2016, pp. 13–17).

(19) **Proposed analysis based on prosodic domains**

a. *béri* 'day' + *ó* → *beriyó* → *beryó* [berjó]
   (beryó)$_{\text{PWord}}$

b. *béri* 'day' + *ka* → *bériga*
   (béri)$_{\text{PWord}}$ = ga

There are a few problems with such an analysis. First, the form which is ruled out, is not **beriyó* (as indicated in the quote above, from Green and Morrison 2018, p. 226),

but rather **beriój*. The plural suffix *-ój* in (17)–(18) above is vowel-initial, and therefore, it is not directly comparable to the definite article, which is consonant-initial. We argue that a better analysis of the pair *béri – beryó* is glide formation from hiatus resolution (/CVCV-V/). In contrast, there is no hiatus to resolve in the form *bérig*a, and thus no appeal to clitichood is necessary to account for the difference between *-ój* and *-ga*.

Second, there are other CVCV words that take a consonant-initial plural suffix *-yój*, and in those cases, there is no syllable reduction. This is illustrated in (20).[4]

(20) **Lack of syllable reduction**

		SG	SG.DEF	PL	PL.DEF
a.	'ox'	*díbi*	*díbiga*	*dibiyó*	*dibiyáda*
b.	'river'	*webí*	*webíga*	*webiyó*	*webiyáda*
c.	'color'	*mídab*	*mídabka*	*midabyó*	*midabyáda*
d.	'group'	*cútub*	*cútubka*	*cutubyó*	*cutubyáda*

While Green and Morrison's (2018) account would predict the plural forms in (20a)–(20b) (/CVCV-CV/) to reduce (to CVCCV), they actually surface as CVCVCV. Furthermore, the predicted forms **dibyój* and **webyój* are not ruled out by phonotactics, as the resulting cluster (*by*/[bj]) is found in other words, here illustrated by *midabyój* and *cutubyój* in (20c)–(20d). If the lack of syllable reduction in forms such as *díbiga* is accounted for by proposing a domain boundary between the noun and the article, this would not explain the lack of syllable reduction in the suffixed form *dibiyój*. Instead, analyzing the vowel-glide alternations in pairs like *béri – beryój* as hiatus resolution would capture both of the forms *díbi-ga* and *dibi-yój*: there is no hiatus to resolve in these cases. Again, no appeal to prosodic boundaries or clitichood is necessary.

Third, the vowel-zero alternations in the pair *ílig – ilkój* is of a different nature, since the singular form ends in a consonant. Schematically, the syllable reduction analysis of these forms can be represented as (C)VCVC-V → (C)VCCV. These alternations do not seem to us to shed any light on the wordhood status of determiners: when determiners are added to (C)VCVC nouns, the resulting structure is (C)VCVC-CV. The lack of syllable reduction is thus predicted by the fact that the result would be *(C)VCCCV, with three consonants intervocalically, an illicit cluster in Somali. That is, the lack of syllable reduction in the form *ílig-ga* 'the tooth' is explained by the fact that this would have led to the form **ílgga*, and no appeal to a

[4]As is typical of Cushitic languages, Somali has several plural formation strategies (see e.g. Saeed 1999, pp. 56–63). Notice that while the plural suffix in (20) looks superficially similar to the *-ój* suffix in (17)–(18) above, the plural definite forms reveal that these are in fact two different suffixes: *-ój/áha* in (17)–(18), and *-yój/yáda* in (20). While the *-ój/áha* suffix creates hiatus when the noun ends in *-i*, the *-yój/yáda* suffix does not.

domain boundary is necessary.[5]

Finally, we would like to point out that Green and Morrison (2016, pp. 16–17) analyze the interrogative determiner *-geé* the same way as they analyze plural suffixes (as forming a recursive prosodic word with the noun) due to the resulting tone pattern (e.g. *ilig-geé?* 'which tooth?'). It seems to us that this analysis would predict syllable reduction when vowel-final nouns are suffixed with *-geé*, but instead, *-geé* behaves exactly like the definite article *-ga*. This is illustrated in (21), and for comparison, the two plural suffixes *-ó* and *-yó* are repeated in (22).

(21) **C-initial determiners**

a. *beri-geé?* 'which day?'
ilig-geé? 'which tooth?'

b. *béri-ga* 'the day'
ílig-ga 'the tooth'

(22) **V-initial vs. C-initial plural markers**

a. *bery-ó* 'days'
ilk-ó 'teeth'

b. *dibi-yó* 'oxen'
midab-yó 'colors'

If there were a process in Somali that applied between roots and affixes (e.g. all plural forms with the structure CVCV-CV), but were blocked at the noun-determiner boundary (in all forms with the same CVCV-CV structure), this could in theory have provided evidence for a domain boundary. The proposed *syllable reduction* rule does not constitute such a process, and there are, to our knowledge, no such processes in the language.

2.2 Sandhi alternations

Another issue that arises when using tone as a diagnostic for wordhood, is that it conflicts with another phonological process in Somali, namely the sandhi alternations mentioned in section 1.2, which apply between a noun and its determiner. The absence of sandhi has been proposed to mark a boundary between two "Phonological Phrases" (Green and Morrison 2016), or two elements within a "Complex Word Group" (Downing and Nilsson 2019). In this section, we argue that using

[5]Under Green and Morrison's analysis, the second vowel in words like *ílig* is deleted by syllable reduction when suffixes are added. An alternative approach is that the stem is actually *ílk*, and that a vowel is epenthesized in order to break up an otherwise illicit final consonant cluster, schematically /ílk/ → [ílig]. It has no bearing on our point here which of these two approaches is correct, as it remains the case either way that the presence or absence of the second vowel is determined by whether the following suffix begins with a consonant or a vowel. For more on the epenthesis analysis of vowel-zero alternations in Somali, see Barillot (2002, p. 280).

tone as a diagnostic for the PWord domain and sandhi as a diagnostic for a domain higher in the Prosodic Hierarchy leads to conflicting criteria.

Examples of sandhi alternations with masculine nouns were illustrated in (9)–(10), and examples with feminine nouns are provided here in (23)–(24): The initial [t] of a feminine determiner is realized as [ð] (spelled <d>) after [ħ] (spelled <x>). See Saeed (1999, pp. 28–29) for the full set of sandhi rules.

(23) **Sandhi between noun and definite article**

a. *carruúr* + *ta* → *carruú**rt**a* [ʕarruúrta] ‘the children’

b. *madáx* + *ta* → *madá**xd**a* [madáħða] ‘the leaders’

(24) **Sandhi between noun and possessive determiner**

a. *carruúr* + *tayáda* → *carruú**rt**ayáda* [ʕarruúrtajáda] ‘our children’

b. *madáx* + *tayáda* → *madá**xd**ayáda* [madáħðajáda] ‘our leaders’

The sandhi alternations apply between nouns and determiners regardless of their tone pattern (23)–(24), but do not apply between nouns and adjectives (25) or between a noun and a derivational suffix (26).

(25) **No sandhi between noun and adjective**

madáx + *toosán* → *madá**x** **t**oosán* [madáħ toosán] ‘straight/honest leaders’

(26) **No sandhi between noun and derivational suffix**

madáx + *toóyo* → *mada**xt**oóyo* [madaħtoójo] ‘presidential building’

The table in (27) illustrate that all combinations of tone and sandhi are attested. Therefore, one cannot predict the tone patterns from the presence or absence of sandhi, or vice versa.

(27) **Tone and sandhi combinations**

	1 tone	2 tones
Sandhi	*madax-deé*	*madáx-dayáda*
	‘which leaders?’	‘our leaders’
	noun + interrogative determiner	noun + possessive determiner
No Sandhi	*madax-toóyo*	*madáx toosán*
	‘presidential building’	‘straight/honest leaders’
	derived forms and compounds	noun + adjective

An analysis in which tone is used as a diagnostic for the PWord, while the absence of sandhi alternations is used as a diagnostic for a higher domain boundary (along the lines of Downing and Nilsson 2019; Green and Morrison 2016), thus leads to conflicting criteria: appealing to a Phonological Phrase has the consequence that derived forms such as *madax-toóyo* need to be analyzed as single words (because there is only one High tone, and no High tone on the root *madax*), but two phrases (due

to the lack of sandhi). Especially problematic for this approach is the existence of both *madax-deé* and *madax-toóyo*: in both types of constructions, only the final morpheme retains its High tone, and they would therefore be single words. However, sandhi applies within one and not the other.

These facts are not satisfactorily addressed in previous accounts, as they only include subsets of the data: Green and Morrison (2016) do not account for compounds and derivations like *madax-toóyo*, which have a single High tone and no sandhi. Downing and Nilsson (2019) analyze such examples as forming a *Complex Word Group*, to account for the lack of sandhi, but do not mention noun + interrogative constructions like *madax-deé*. The tone pattern of *madax-deé* suggests that it should be grouped with compounds and derivations, but this would leave the presence of sandhi unexplained.

When the full set of data in (27) is taken into account, it becomes clear that one cannot use sandhi and tone as diagnostics for prosodic domains, as these diagnostics are in conflict. Notice that both sandhi and tone patterns are predictable from the properties of the morphological and syntactic constructions. While an analysis in terms of prosodic domains could have opened up for deeper empirical generalizations, this does not seem to be the case.

2.3 Section summary

In the present section, we have revisited some of the phonological processes in Somali, and provided novel analyses and perspectives. We have illustrated that the domains for tone assignment, syllable reduction, and sandhi alternations in Somali do not line up. To our knowledge, there are no other phonological processes that apply within the PWord domain as it is defined by Green and Morrison (2016, 2018) and Downing and Nilsson (2019), besides the proposed *one High tone per word* rule. Using the High tone as the sole diagnostic for wordhood leads to circularity. We conclude that no satisfactory definition of a Somali "word" has been provided, and hence, that there is no way of validating the proposed "one High tone per word" rule. To account for examples like *gúri-gáyga* 'my house' and *madáx-dayáda* 'our leaders' within this approach, one essentially ends up defining the *word* in a way that makes the *maximum one High tone per word* rule true. We argue that this does not offer any principled account of the data. Therefore, a new approach to the prosodic system in Somali is warranted.

3 Loanword prosody

So far, we have argued that one runs into issues of circularly defined domains and conflicting criteria when accounting for the distribution of the High tone in Somali in terms of the prosodic word. Instead of forcing examples like *gúri-gáyga* 'my house' into an analysis in which they consist of two words, we propose that such constructions provide clues to how the system truly functions. In essence, they lead us to question the plausibility of speakers having made a connection between the number of High tones and the number of words, and to doubt that the *one High tone per word* rule is cognitively real. Without any independent evidence of the word domain referenced by the *one High tone per word* rule, it is impossible to validate the proposed rule by native data alone, and one needs to look into how speakers treat novel words.

In this section, we present novel data showing that loanwords may have two High tones, and hence, that the *one High tone per word* rule is not productive. We conclude that previous accounts of the prosodic system in Somali not only run into analytical issues, they also fail to account for all the data, as there are words that have two High tones, even though they lack any structure that warrants a segmentation into prosodic words.

3.1 Borrowing and productivity

When words are borrowed, they are phonologically adapted in order to fit the structure of the recipient language. It has been argued that loanword adaptations are like naturally occurring *wug*-tests (Berko 1958) in that they allow us to assess aspects of speakers' grammatical knowledge that are not obvious from the native data (Kang 2011, p. 2258). They can therefore shed new light on the native phonology of a language (Hyman 1970). One way of assessing whether the proposed "one High tone per word" rule in Somali is productive, is hence to see whether it applies to loanwords.

A caveat is in order here. Loanword adaptations are tricky to interpret, and there is an alternative approach of analyzing loanwords as "exceptional" or as having their own phonological subgrammar (see e.g. Ito and Mester 1995a,b, 2008). An example of how scholars may disagree on how to interpret borrowings comes from Scandinavian, for which loanword adaptations have been used in support of opposite views of what the "default" accent is. Loanwords in many Scandinavian dialects are typically assigned accent 1 rather than accent 2, as in *[1]nummer* 'number', *[1]tiger* 'tiger', *[1]bibel* 'bible', *[1]regel* 'rule'. It was long generally assumed that if there is a privative contrast between the Scandinavian accents, accent 1 is the default and accent

2 is lexically specified (e.g. Haugen 1967; Kristoffersen 2000; Riad 1998), and loanwords thus get assigned the "default" accent. However, it was later argued that it is accent 1 which is the lexically specified accent, and that assigning accent 1 to loanwords is a way of marking them as being "special" or "nonesuch" (Lahiri, Wetterlin, and Jönsson-Steiner 2005; Wetterlin 2010; Wetterlin, Jönsson-Steiner, and Lahiri 2009). That is, the same data have led different scholars to diametrically opposite conclusions. Both sets of analyses regarding lexical specificity of the accents are of course based on evidence beyond loanwords – the point here is that this particular piece of evidence has been interpreted in different ways (see Riad 2009 for more on "markedness" in the Scandinavian accent distinction).

In the case of Somali, one could always counter the loanword data to be presented in the present paper as "exceptional". However, as we will elaborate on further below, we believe that the basic insights that the loanwords provide are lost under such an approach, which furthermore would fail to capture *why* two High tones are possible in loanwords. Our claim is that it is possible precisely because of native constructions such as *gúri-gáyga* 'my house'. What is new in the loanwords, is not their tone patterns, but rather, as we will see, how native *prosodic schemas* are used in novel ways.

3.1.1 Language borrowing and speech borrowing

There are several previous studies of loanwords in Somali (Banti 2013; Callegari 1988; Cardona 1988; Diriye Abdullahi 2000; Mansuur 2011; Mioni 1988; Soravia 1994; Waasuge 1987; Zaborski 1967, 2009), but none of them treat tonal adaptations. Moreover, these studies investigate established loanwords, and any adaptations illustrate therefore the outcome of a diachronic process, and not necessarily a synchronic one. For example, the Arabic word *mu^{c}allim* 'teacher' has been borrowed as *macalli**n*** (Zaborski 2009, p. 274), with a final [n]. In contrast, the root in *macalli**m**-ad* 'female teacher' ends in [m]. As [m] is permitted only in front of vowels and homorganic stops in Somali (see Orwin 1994, p. 232 and Saeed 1999, p. 10 for details), the change from final [m] to [n] in Arabic *mu^{c}alli**m*** to Somali *macalli**n*** can readily be explained as an adaptation to fit the native Somali phonological patterns. But as this word is an established loanword by now, the form children is exposed to when learning Somali is *macallin*, which already has a final [n]. Established loanwords do not necessarily illuminate speakers' intuitions about the native Somali phonology synchronically, but rather illustrate outcomes of adaptations that have taken place in the past. See e.g. Peperkamp (2004, p. 342) on this view. The adaptations thus reflect processes that were active at a previous stage of the language (see Banti 2013 for more on strata of Semitic loanwords in Somali).

After such an adaptation (e.g. [m] → [n]), the recipient language may change and the rule may become unproductive, even though the alternations remain (e.g. *macalli**n** – macalli**m**-ad*). In such cases, the alternations will lack any synchronic motivation (see Hualde 1999 for an example with Spanish borrowings in Basque). There are loanwords in Somali such as *Islaam* 'Islam' and *muhiim* 'importance' (both from Arabic) which exhibit [m] in final position, and this indicates that there is no synchronic ban on [m] in coda position in Somali anymore. Alternations such as *macalli**n*** 'teacher' – *macalli**m**ad* 'female teacher' may simply be learned conventionalized patterns rather than the outcome of a productive process. We do not aim to analyze this particular process here, but rather, to make the point that there is no way of knowing to what extent a process is productive based on native data alone. The question of whether phonological processes are still active, needs to be answered by investigating how novel words are treated (see also Bybee 2003, p. 13).

We adopt Grosjean's (1989, p. 9) term *language borrowing* for established loanwords, i.e. loanwords that have become part of the recipient language's lexicon, and the term *speech borrowing* for spontaneous borrowing performed by bilinguals. Grosjean (2010, p. 28) argues that the two types differ in lexical access: the former involves regular lexical access in a single language, and the latter refers to a process where one looks up a word in the mental lexicon of one language and runs it through the grammar of another. Speech borrowing may therefore illustrate the rules and processes that are synchronically productive in a language—they are "*online adaptations*, i.e. foreign words that are borrowed 'here-and-now'" (Peperkamp 2004, p. 342). Note that both types of borrowing are distinct from *code-switching*, which involves a complete shift to the other language, either on the word, phrase or sentence level (Grosjean 1982, p. 308).

3.1.2 Previous research on loanword prosody

Previous research on loanword prosody suggests that when words are borrowed, the prosodic properties of their input form (tone, stress, accent) may either be preserved or ignored (Kang 2010, Davis, Tsujimura, and Tu 2012). When describing prosodic adaptations of loanwords, we will appeal to the notion *prominence*, based on a perceptual definition which holds regardless of the phonological category that creates the percept: "Prominence is the property by which linguistic units are perceived as standing out from their environment" (Terken 1991, p. 1768). A type of input prominence preservation attested in loanword adaptations are cases in which the syllable that has stress in the source language gets a High tone in the recipient language (see Kang 2010, pp. 2296–2302 for examples from several languages).

In other cases, the prosodic properties of a word in the source language may be

partially or completely ignored. Instead, tone, stress, or accent may be assigned based on the patterns of the native phonology of the recipient language. For example, if the location of stress in the input form violates the native stress pattern, stress may be shifted to another position. This is the case in loanwords in Finnish, which has initial stress – stress is shifted to this position in loanwords (28). However, another pattern is attested in American varieties of Finnish: in the examples in (29), segments are truncated instead. With truncation, input stress is preserved without violating the native restrictions on stress position.

(28) **Stress shift in homeland Finnish** (Kang 2010, p. 2305)
mu'sik (Swedish) → 'musi:kki 'music'
pi'rok (Russian) → 'pi:rakka 'pie'
va'cation (English) → 'väke:si

(29) **Truncation in American Finnish** (Kang 2010, p. 2305)
ga'rage → 'kra:tsi
a'partment → 'partmentti

Kang (2010) suggests that the difference in strategy – stress shift vs. segmental deletion – can be explained by the difference in language contact situation: a higher degree of bilingualism in the American Finnish speakers may be a factor favoring prominence preservation in (29). Another factor reported to influence the choice of strategy is the properties of the prosodic systems involved: if the recipient language has strict restrictions on the distribution of prominence, "it is often impossible to faithfully preserve input language prominence in the original position" (Kang 2010, p. 2295). What we could have seen in (29), is that input prominence was preserved without truncation – instead, both input prominence and native restrictions are obeyed, but only by deleting something else in the input.

We may expect a similar tension to play out in adaptation strategies in Somali, as the High tone is said to have restrictions on its distribution (see section 1.1). That is, prominence preservation could in theory be possible only when it does not violate the proposed culminativity and positional restrictions. As we will see in the next section, input prominence preservation and native tone assignment are two strategies that may co-occur within the same word, but in different locations, resulting in two High tones. That is, it is not the case that one strategy "wins" over another, as in the Finnish examples in (28)–(29). Rather, two strategies are employed, resulting in a violation of the proposed *one High tone per word* rule.

3.2 Tonal adaptations of Norwegian loanwords

In the present section, we examine tone patterns in Norwegian loanwords (i.e. the outcome of speech borrowing) borrowed by Somali speakers living in Norway. The

data were collected during fieldwork in Oslo, and consist of a combination of spontaneous speech (conversations between two speakers) and elicitation. The speakers are all late learners of Norwegian, who left the Horn of Africa and arrived in Norway after the age of 18, and use both Somali and Norwegian every day. Further details about the speakers and the data can be found in the Appendix.

3.2.1 Loanwords may have two High tones

As the examples in (30)–(31) show,[6] loanwords may have two High tones. The first thing to note is that there are both monomorphemic words and compounds with two High tones. The words included in the analysis were all morphologically adapted to Somali (see the Appendix for details): in these examples, the loanwords from Norwegian bear the Somali definite suffix *-ka/-ga*.

(30) **Monomorphemic loanwords with two High tones**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[borókolíi-ga]	[bɾɔ̀kuɭi]	brokkoli	‘broccoli’
[éeventiír-ka]	[êːʊn̩tyːɾ]	eventyr	‘fairy tale’
[légsikón-ka]	[ɭɛ̀ksikɔn]	leksikon	‘lexicon’
[miléenijúm-ka]	[miɭɛ̀niɯm]	millenium	‘millenium’

(31) **Compounds with two High tones**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[gurúnskúul-ka]	[gɾû̠nskuːɭə]	grunnskole	‘primary school’
[síkamélin-ka]	[sŷːkəmɛɭiŋ]	sykemelding	‘sick leave letter’
[natúrfáag-ga]	[nɑtʉ̀ːɾfɑːg]	naturfag	‘sciences’
[naʃunáaltejatár-ka]	[nɑʂunàːltɛɑːtɾ̩]	nasjonalteater	‘national theater’
[nóʃkúʃ-ka]	[nɔ̀ʂkʉːʂ]	norskkurs	‘Norwegian course’
[fréedáag-ga]	[fɾèːdɑg]	fredag	‘Friday’
[bulitíikaamár-ka]	[puɭitìːkɑmɾ̩]	politikammer	‘police station’

[6]The transcriptions of the Norwegian pronunciation illustrate the Oslo dialect of *Urban East Norwegian*, which is what the Somali speakers have learned and are exposed to. We follow Kristoffersen’s (2000) transcription conventions, with the following exceptions: syllable boundaries are not marked, and the tonal accents are marked with a grave accent for a Low tone (*accent 1*) and a circumflex for a High-Low contour (*accent 2*) (this captures the surface realization of the tonal accents in this variety of Norwegian; see Bye (this volume) for variation across Scandinavian). Norwegian is commonly analyzed as having a prosodic system in which stressed syllables (which otherwise have no direct phonetic correlate) are the location for two phonological contrasts: vowel quantity and tonal accent (see e.g. Kristoffersen 2000, p. 141). The location of stress is indicated here by the aforementioned diacritics marking tone rather than with stress marks. For reasons discussed elsewhere (Stausland Johnsen 2019), we adopt the position here that Norwegian does not have secondary stress. Note that our analysis and conclusions do not rest on this choice.

These examples illustrate that it is possible to assign two High tones to a word regardless of its morphological structure. Therefore, it is not the case that one can account for the words with two High tones as consisting of two Prosodic Words, as this would require a PWord boundary placed within a monomorphemic word. It seems to us that treating [borókolíi-ga] as two prosodic words would make the *one High tone per word* rule unfalsifiable.

We analyze the two High tones as having two different functions: The leftmost tone preserves the prosodic prominence of the word in its Norwegian pronunciation as a Somali High tone. The rightmost tone is a way of further nativizing the word by assigning a High tone to the final or penultimate mora of the noun, which is required in the language. Regarding the first function, prominence preservation, notice that the leftmost High tone occurs on the syllable corresponding to the one that has tonal accent in Norwegian. As evident from the data in (30)–(31), the tonal contrast in Norwegian (Low versus High-Low) is lost when these words are borrowed into Somali, but the relative *prominence* of the syllables with tonal accent in Norwegian is preserved with a Somali High tone: compare [miléenijúm-ka] < [miˌɭɛ̀niɯm] (with a Low tone in Norwegian) and [éeʋentiír-ka] < [êːʊn̩tyːɾ] (with a High-Low in Norwegian).[7]

The rightmost High tone occurs on either the final or the penultimate mora of the noun (not counting the definite article), as is the case also in native nouns, such as *ínan-ka* ‘the boy’ and *inán-ta* ‘the girl’. Somali is widely cited as having tonal gender marking on nouns, such that masculine nouns have a penultimate High tone, and feminine nouns have a final High tone. However, the tone-to-gender correlation is not perfect, neither in monomorphemic nouns (Andrzejewski 1964; Saeed 1999), nor in compounds (Kaldhol 2019). As illustrated in (30)–(31) above, there are loanwords that are masculine, but have a final High tone (e.g. *légsikón-ka*). This does not mean that these words are not nativized, since there are native words too that are masculine and have a final High tone (e.g. *jiír-ka* ‘the rat’), and this is also found in established loanwords (such as *albaáb-ka* ‘the door’, from Arabic). Furthermore, in loanwords, the variable tone assignment pattern is not restricted to the words with two High tones, but found in loanwords with a single High tone as well, as illustrated in (32). Here, all nouns are masculine, and some have a final High tone, others a penultimate one.

[7]Here, we refer to *prominence* as defined in section 3.1.2, that is, “the property by which linguistic units are perceived as standing out from their environment” (Terken 1991, p. 1768). In Urban East Norwegian, the prominent syllable is marked either by a Low tone or a Falling tone (High-Low).

(32) **Loanwords with one High tone**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[biblijutéeg-ga]	[bibl̩iutè:k]	bibliotek	‘library’
[karagtéer-ka]	[kɑɾɑktè:ɾ]	karakter	‘grade’
[matamatíg-ga]	[mɑtəmɑtìk]	matematikk	‘math’
[enarkoó-ga]	[ɛnæɾkò:]	NRK	(proper noun)
[traafikaánten-ka]	[tɾɑfikɑ̀ntn̩]	Trafikanten	(proper noun)
[forfaáter-ka]	[fɔɾfɑ̀tɾ̩]	forfatter	‘author’

The words in (32) are nativized by having a final or penultimate High tone, but the choice is not predictable from gender: Most nouns, including all the examples in (32), are borrowed as masculine nouns, but may still have a final High tone.

These examples also illustrate that input prominence preservation and the presence of a final or penultimate High tone may converge: The Norwegian pronunciation of the words in (32) have a final or penultimate tonal accent. In these cases, preservation of input prominence leads to a final or penultimate High tone, and there is no need to assign a second High tone. That is, one could in theory have expected *traafikaántén-ka*, but instead, only a single High tone occurs (*traafikaánten-ka*). Input prominence is preserved while simultaneously obeying the criterion that nouns have a final or penultimate tone.

3.2.2 Nouns of Declension 2

The patterns are slightly more complex when loanwords are assigned to the Somali inflectional class which Hyman (1981, p. 180) calls *Declension 2*. This class consists of masculine words ending in *-e* in their citation forms, and feminine nouns ending in *-o*, as illustrated with the native Somali words *báre* ‘teacher’ and *dáwo* ‘medicine’. The morphological status of the final vowels of these words has been debated, as they seem to behave partly as suffixes and partly as thematic vowels (Lampitelli and Le Gac 2016). They sometimes act as derivational suffixes, and *-e* may have an agentive or instrumental meaning, as in *bár* ‘teach’ – *báre* ‘teacher’, and *fúr* ‘open’ – *fúre* ‘key’. This is not always the case, though: for example, *túke* ‘crow’ has no corresponding word **túk*.

In their definite forms, words of this declension have a High tone on the final mora of the noun, and the final vowel of the stem is *-a*, e.g. *bará-ha* ‘the teacher’, *dawá-da* ‘the medicine’. The definite article is *-ha* in the masculine and *-da* in the feminine.

As the examples in (33)–(34) illustrate, the same properties are found in loanwords that are assigned to this class. The words in (33) are most likely borrowed

as Declension 2 nouns because their Norwegian forms end in *-e*/[ə]. However, assigning a loanword to this declension is also a strategy for avoiding an illicit consonant cluster (consonant clusters are only allowed intervocalically in Somali), as illustrated in (34).

(33) **Norwegian pronunciation ending in -ə**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[kaasá-da]	[kɑ̂sə]	kasse	'cash register'
[helsá-ha]	[hɛ̂ɭsə]	helse	'health'
[sturtiŋgá-ha]	[stû:ʈiŋə]	Stortinget	'the parliament'
[komuná-ha]	[kumû:nə]	kommune	'municipality'

(34) **Norwegian pronunciation ending in a consonant cluster**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[helg-á-ha]	[hɛ̀lg]	helg	'weekend'
[noʃk-á-ha]	[nɔ̀ʂk]	norsk	'Norwegian'
[tolk-á-ha]	[tɔ̀lk]	tolk	'interpreter'
[gaŋg-á-ha]	[gɑ̀ŋ]	gang	'hallway'

Note that the Norwegian pronunciation of the final example in (34), [gɑ̀ŋ], does not end in a consonant cluster. The adaptation to [gaŋg-á-ha] in Somali, with the cluster [ŋg], may be influenced by the orthographic form *gang*. Alternatively, the [g] may be added in order to preserve the [ŋ] in the Norwegian form of the word; [ŋ] is only found allophonically in Somali as the result of place assimilation of /n/ in front of a velar consonant.

There is variation in how words assigned to Declension 2 are tonally adapted. All of the examples discussed so far have a single High tone, as in [sturtiŋgá-ha], even when one in principle could have had two (e.g. [stúrtiŋgá-ha], an unattested form in our data set). However, as the examples in (35) show, there are also loanwords of Declension 2 that have two High tones. The same tonal adaptation pattern is found here as with the nouns discussed above: the leftmost High tone occurs on the syllable corresponding to the one that has a tonal accent in the Norwegian form of the word. The tonal contrast in Norwegian is lost, and instead, the relative prominence of this syllable is preserved as a Somali High tone. The second High tone occurs on the final mora of the noun, as is the case for all native Somali nouns of Declension 2.

(35) **Declension 2 nouns with two High tones**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[lóonekaasá-da]	[l̂ôːnəkɑsɑ]	Lånekassa	(proper noun)
[narkóotiká-da]	[nɑɾkùːtikɑ]	narkotika	‘drugs’
[ʃaárastá-ha]	[çæ̂ːɾəstə]	kjæreste	‘girl-/boyfriend’
[spóokelsá-ha]	[spô̤ːkl̩sə]	spøkelse	‘ghost’
[hélvetá-ha]	[hɛ̂l̩vətə]	helvete	‘hell’
[óbgaawá-ha]	[ɔ̂pgɑːvə]	oppgave	‘task’
[ʃílsmisá-ha]	[ʂìl̩smisə]	skilsmisse	‘divorce’
[stáafalsá-ha]	[stɑ̂ːv̩sə]	stavelse	‘syllable’
[úutaalá-ha]	[ʉ̂ːtɑːl̩ə]	uttale	‘pronunciation’
[báanahagá-ha]	[bɑ̂ːɳəhɑːgə]	barnehage	‘kindergarten’
[táanleegá-ha]	[tɑ̂nl̩eːgə]	tannlege	‘dentist’
[kontáanstotá-ha]	[kuntɑ̀ntstøtə]	kontantstøtte	‘child support’
[sbóraʃeemá-ha]	[spœ̂ɾəʂeːma]	spørreskjema	‘questionnaire’
[fíderegooná-ha]	[vîːdɾəgoːnə]	videregående	‘high school’

3.2.3 A note on variation

Because the examples provided in this section illustrate speech borrowing by active bilinguals, variation is to be expected. The presence of variation arguably supports our view that these adaptations reflect speakers’ intuitions about the processes that are active in their language, rather than conventionalized forms: Speakers may have competing generalizations to choose from when adapting novel words. The same speaker may adapt the same word in different ways, not only with respect to the number of tones occurring on a Declension 2 noun, but also in the assignment of declension. As illustrated in (36), *kommune* may be assigned to Declension 2 (*komuná-ha*), like most loanwords ending in *-e*/[ə]. However, the final vowel may also be deleted, in which case the noun is treated like native nouns ending in *-n*, such as *kallúun-ka* ‘the fish’ (that is, as a masculine noun of what is called Declension 1 in Hyman 1981).

(36) **Variation in adaptation**

Somali adaptation	*Norwegian pronunciation*	*Norwegian orthography*	*Translation*
[komuná-ha] ∼ [komúun-ka]	[kumʉ̂ːnə]	kommune	‘municipality’

As for the occurrence of two High tones, our goal is not to claim that there are instances where this is *necessary*. Rather, we simply aim to illustrate what is *possible*, that is, what are viable schemas accessible to speakers.

3.3 Discussion

The data presented in this section illustrate that Somali speakers both can and do assign two High tones to a word. The loss of the tonal contrast in the Norwegian form of loanwords shows that they are in fact tonally adapted, and thus, loanwords are indeed nativized. For example, a word like [bɾɔ̀kuˌi] has a Low tone on the initial syllable in Norwegian, so the presence of a High tone on this syllable in the Somalicized loanword ([borókolíi-ga]) does not simply mimic the surface pitch pattern of the Norwegian pronunciation. Rather, the relative prominence of this syllable in the Norwegian word is preserved by the phonological means available in Somali, namely, a High tone. Moreover, the second tone of the loanwords presented above makes sure that these words obey the Somali pattern of having a final or penultimate High tone, which is a further argument against a possible objection that these words are not nativized.

In native Somali words, tone patterns are generally predictable from the morphemes involved. The constructions in the language and their tone patterns are inherited structures, which constitutes the linguistic input that speakers are exposed to when acquiring the language. Therefore, it is not the case that speakers arbitrarily assign two High tones to native monomorphemic words, which have a single High tone in their inherited forms. Independent motivation is needed in order to assign two High tones to constructions other than the ones discussed in section 1.2 (e.g. *gúri-gán* 'this house'). In the case of loanword adaptations, this motivation is present in the form of a drive to preserve properties of the input form of loanwords.

The resulting prosodic structures, e.g. in *borókolíi-ga* 'the broccoli', have clear parallels in native Somali structures, namely the ones in constructions like *gúri-gíisa* 'his house'. In other words, the tone patterns found in loanwords are not foreign to the language, but parallel exactly those native patterns that are problematic for the proposed *one High tone per word* rule. The difference is that while there is a morpheme boundary within *gúri-gíisa* 'his house' which has formed the basis for previous accounts of such constructions as two PWords, no such analysis is possible for words like *borókolií-ga* 'the broccoli' and *hélvetá-ha* 'hell', as these nouns are monomorphemic.[8]

There is therefore a crucial difference between the present data and cases in which a new phoneme or feature is introduced into the language, such as the voice-

[8]Such accounts have in fact been proposed for other languages. For example, while most monomorphemic Norwegian words have maximum one long vowel, there are words that have two, such as *eventyr* [êːʊn̩tyːɾ] 'fairy tale'. Kristoffersen (2000, pp. 187–188) analyzes such words as *formal compounds*, that is, monomorphemic words comprised of two prosodic words, though points out that "it is not possible to identify internal constituents by means of morphological criteria" (p. 187). Such an approach essentially ends up redescribing the patterns rather than providing a principled account of them, and makes the "maximum one long vowel per word" proposal unfalsifiable.

less uvular fricative [χ] found in Arabic loanwords in Somali, e.g. *shíikh* [ʃíiχ] 'sheik' (see Saeed 1999, p. 7; Zaborski 1967). Such loanwords introduced a new phoneme into the Somali inventory, while the Norwegian loanwords are integrated into Somali by the novel use of a native tone pattern.

There is also a crucial difference between the present data and cases in which new stress patterns are introduced into the language, which has been argued to be the case for many Germanic languages, including Norwegian (Kristoffersen 2000, pp. 142–161; Rice 2006): the surface tone patterns that we see in e.g. *borókolíi-ga* and *miléenijúm-ka* are not *new* in a concrete sense, as they already exist in native constructions such as *hungúri-gíisa* 'his throat' and *daméer-kayága* 'our donkey'. They are new only in a more abstract sense, in that there are no morpheme boundaries anywhere between the two High tones in examples like *borókolíi-ga*. This indicates that the tone patterns found in native constructions such as *hungúri-gíisa* 'his throat' are viable schemas that speakers have at their disposal and can make use of in novel ways.

This insight would be lost if one simply argued that loanwords are "exceptional" or have their own phonological sub-grammar (along the lines of the approach taken by e.g. Ito and Mester 1995a,b, 2008 for Japanese). Instead, we argue, following Hout (2019, 2020), that "exceptions" in fact may provide clues to how a system truly functions. The findings in the present paper have implications for how the native data are analyzed: they suggest that the *one High tone per word* rule is not productive and thus that the proposed PWord domain is not the right unit for accounting for the distribution of the High tone in Somali. Rather, the presence, absence, location and number of High tones are predictable from, and therefore also properties of, the morphological and syntactic constructions. The tone patterns found in loanwords are not new, but reflect the novel use of existing prosodic schemas.

Finally, we would like to point out that while some of the examples described above are compounds in Norwegian (e.g. [bulitíikaamár-ka], *politi-kammer* 'police station'), and thus potentially could have been analyzed as consisting of two prosodic words, there are two reasons why it is not the case that loanwords that are assigned two High tones by Somali speakers are borrowed as two prosodic words. First, nominal compounds in Somali only have one High tone, as illustrated with *cod-kár* 'orator' and *dhaqdhaqaaq-kacaanéed-ka* 'the revolutionary movement'. Second, there are also monomorphemic loanwords with two High tones, such as [borókolíi-ga] 'the broccoli' and [hélvetá-ha] 'hell'. Analyzing these as two PWords would require a PWord boundary placed inside a morpheme. An account along these lines would not be falsifiable.

3.4 Section summary

In this section, we have presented novel data illustrating how Norwegian loanwords are treated when borrowed by Somali speakers. We have shown that the loanwords are both tonally and morphologically adapted, as evident from facts like the loss of the tonal contrast in Norwegian, and the assignment of certain nouns to the Somali Declension 2. Because the loanwords are adapted to the Somali structures, the adaptations illuminate speakers' intuitions about what these structures are. The fact that loanwords in Somali may have two High tones suggests that the proposed *one High tone per word* rule is not productive. We analyze the two tones in words like [légsikón-ka] 'the lexicon' as serving different functions: The leftmost High tone preserves the prosodic prominence of the Norwegian pronunciation of the word (in this case [l̩ɛ̀ksikɔn]), and the rightmost High tone satisfies the requirement that nouns in Somali have a final or penultimate High tone.

4 Conclusion

Speakers' generalizations are not always the same as those devised by linguists (Bybee 2003, p. 13). In the present paper, we have presented novel data illustrating that loanwords in Somali may have two High tones. This raises questions about the synchronic productivity of the previously proposed *one High tone per word* rule in Somali. Previous research on loanword prosody suggests that speakers either preserve input prominence, or ignore it and rather assign stress, accent, or tone based on native rules (Kang 2010). However, this is not what we see in the Somali data. Somali speakers may preserve input prominence in one location of a loanword, *and* assign an additional final or penultimate High tone, required by the Somali grammar, in another location within the same word. This is illustrated with the example in (37).

(37) [borókolíi-ga]
broccoli-M.DEF
'the broccoli'
(from Norwegian *brokkoli* [bɾɔ̀kul̩i])

We argue that this is possible because of the native Somali constructions with two High tones (see section 1), such as *hungúri-gíisa* 'his throat' and *daméer-kayága* 'our donkey': when borrowing Norwegian words, Somali speakers use the *prosodic schemas* abstracted from these constructions in order to adapt the loanwords to native structures while also preserving input prominence. As indicated by loanwords such as *borókolíi-ga* and *miléenijúm-ka*, these schemas are viable and accessible to speakers, and can be used productively in novel ways. The schemas can be represented as in

(38): moras are represented with a μ, dots indicate syllable boundaries, and accents indicate High tones.

(38) **Prosodic schemas**

	μ.μ́.μ.μ́μ.μ	μ.μ́μ.μ.μ́.μ
native words	hungúri-gíisa	daméer-kayága
loanwords	borókolíi-ga	miléenijúm-ka

The implications of the findings in this paper is that since the *one High tone per prosodic word* rule does not seem to be synchronically productive, the "PWord" is not the right unit for accounting for the distribution of the High tone in Somali. In our view, the goal of a synchronic analysis should be to capture speakers' intuitions about their language, and in order to do so, evidence of productivity is crucial. In the present paper, we have demonstrated the productivity of the prosodic schemas in (38), and thus provided a novel way of conceptualizing the tone patterns in Somali.

Furthermore, we argue that in order to understand synchronic patterns and processes, one needs to understand the history of the language (for more on diachronic explanation in phonology, see e.g. Blevins 2004; Bybee 1994, 2003). There is evidence that constructions with two High tones (such as *gúri-gán* 'this house') are the result of grammaticalization of previously independent words (such as *kán* 'this') to bound forms (Kaldhol and Stausland Johnsen 2020, 2021). Thus grammaticalization accounts for the synchronic distribution of the High tone in Somali. As a result of diachronic change, a new system has developed in which the High tone has lost its accentual properties, as evidenced by how speakers treat novel words.

Finally, we argue that the analytical issues one runs into when assuming culminativity stem from a failure to tease apart synchronic and diachronic factors: the reason why there seems to be a *one High tone per word* rule in Somali, is that this was true of a previous stage of the language, prior to the grammaticalization of independent words to bound forms (Kaldhol and Stausland Johnsen 2020, 2021). The debate around the accentual properties of the prosodic system in Somali thus illustrates a broader point: There is no need to propose a synchronic account of a phenomenon that is not synchronically productive.

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Appendix: About the speakers and the data

The data were collected during fieldwork in Oslo, from nine native speakers of Somali, age 30–65, five men and four women. They are all late learners of Norwegian who live in Oslo and use both Somali and Norwegian every day. All of them arrived in Norway after the age of 18, thus ensuring that incomplete acquisition (Montrul 2008) of Somali is avoided. Their time spent in Norway ranges from five to 35 years. There is a risk of first language attrition (Seliger and Vago 1991), but this is minimized by the fact that they all still use Somali every day. The study was approved by The Data Protection Official for Research, Norwegian Centre for Research Data. The material consists of a combination of spontaneous speech (conversations between two speakers) and elicitation. Some example sentences are illustrated in (39)–(40).

(39) **Vínter**-kíi oo dhán báa la-gú ciyaar-aa.
winter-M.DEF.REM CONJ all FOC INDF.SUBJ-by play-PRS.3SG.M
'People go skiing there all winter.'
[ʊínterkíi] < [ʊìntɽ] *vinter* 'winter'

(40) Wáxa la-gá yaab-aa ín **helg**-á-ha la
FOC INDF.SBJ-from wonder-PRS.3SG.M that weekend-NMLZ-M.DEF INDF.SBJ
i soó wac-ó.
me VEN call-SUBORD
'It is possible that I am called during the weekend.'
[helgáha] < [hɛ̀lg] *helg* 'weekend'

Code-switching is not considered here, as it arguably illustrates the speakers' Norwegian as a second language rather than Somali as a borrowing language. But as pointed out by Grosjean, "a code-switch can be of any length, (a word, a phrase, a sentence)" (1982, p. 308), and how to decide whether single other-language words are instances of borrowing or code-switching is a matter of debate. In Grosjean's approach, a code-switch "is a complete shift to the other language, whereas a borrowing is a word or short expression that is adapted phonologically and morphologically to the language being spoken" (1982, p. 308). Possible criteria for identifying borrowings are therefore phonological and morphological adaptations. As phonology is the object of study here, it is dubious to use it as a criterion for data selection. We therefore used morphological adaptation only, and classified Norwegian words as borrowings rather than code-switches if they had a Somali suffix.

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