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Word Stress and Phrasal Intonation

in Addis Ababa Amharic

A thesis submitted in partial satisfaction  
of the requirements for the degree Master of Arts  
in Linguistics

by

Liam Sebastian Kaech

2022

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2022

ABSTRACT OF THE THESIS

Word Stress and Phrasal Intonation

in Addis Ababa Amharic

by

Liam Sebastian Kaech

Master of Arts in Linguistics

University of California, Los Angeles, 2022

Professor Kie Ross Zuraw, Co-Chair

Professor Bruce Hayes, Co-Chair

Analyses of word-level stress in Amharic have been inconsistent since early grammars of the language were written, with little consensus amongst the authors. While some claim that there is no consistent and systematic assignment of stress, others propose weight-based analyses. Data were collected from a native Amharic speaker who was presented with words and sentences in English; acoustic measurements were performed to evaluate pitch. This study presents a proposal of word-level stress in Addis Ababa Amharic based on phonetic analysis that directly contests the analyses of previous authors to varying degrees. The findings show that there *is* word-level stress, and that it may be predictably assigned based

on the shape and category of a word. This study also proposes a model of intonational phonology of Amharic declarative phrases based on the Autosegmental-Metrical framework. The data show that although Amharic has lexical stress, it patterns with Farasani Arabic in that declarative phrases show no pitch accent; the role of stress in these phrasal contexts is suppressed. As such, in neutral focus, most words constitute an Accentual Phrase (AP), demarcated by a low tone (L) on the left edge, and a high tone (Ha) on the right edge.

The thesis of Liam Sebastian Kaech is approved.

Sun-Ah Jun

Bruce P Hayes, Committee Co-Chair

Kie Ross Zuraw, Committee Co-Chair

University of California, Los Angeles

2022

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# 1 Introduction

## 1.1 General Overview

Linguistic work on Amharic has been documented since the late 17<sup>th</sup> century, with the publication of the first Amharic grammar by Hiob Ludolf in 1698. Since then, multiple other grammars have been written. The presence of stress in the language has generally been understudied, receiving little attention in these grammars; a somewhat detailed account first appeared in Arbuster's 1908 *Initia Amharica: An introduction to spoken Amharic*. Although the topic has been given some attention more recently, the existing literature on Amharic stress presents a quagmire—there is little agreement between authors, and their proposals range for the non-existent status of stress (Ullendorff, 1955), to detailed, but conflicting, analyses. Some authors (Alemayehu, 1987) claim that pitch is *the* phonetic cue to stress, while others (Sande & Heddig, 2017) propose that pitch and intensity are indicative of stress, or that only intensity is a significant cue (Sande et al., 2019). And yet, others provide no indication as to what cues they believe demarcate a syllable as stressed in Amharic. To address the discrepancies between previous accounts, this paper investigates the question of Amharic stress with a fresh perspective, making no initial assumptions based on other accounts. The findings indicate that while Amharic is a stem-bound lexical stress language, the relationship between stress and phrase-level intonation is less straightforward.

The remainder of this paper is organised as follows. The following subsections detail my consultant, and linguistically situate the reader around the Amharic language. In Section 2, I provide a brief overview of the relevant background on Amharic stress. In Section 3, I describe the methodology of this paper. In Section 4, I present and discuss my findings on Amharic stress in words in isolation as well as in phrasal context, and its relation to the declarative intonation; a typological comparison of narrow focus between Amharic and Farasani Arabic follows. In Section 5, I provide a survey of the literature in light of my findings. Section 6 concludes, addresses limitations, and provides avenues for further research.

## 1.2 Consultant

It is worth noting that every author has used distinct consultants for their work. Most authors do not provide any information about their speakers. They have no mention of how many speakers they worked with, nor do they provide any language background information that could indicate the type of dialect they are describing. In hopes of providing some transparency and avoiding what other authors have done, I collected this information from my consultant, whom we may refer to as TM. She is a 36 year-old female, born and raised in Addis-Ababa, Ethiopia. TM lived there until she was 18, when she moved to Montpellier, France in 2005 and lived there for five years. In 2010 she moved to the Washington D.C. area, living there for three years. During this time she began working on translation and

interpretation between English, French, and Amharic, and also taught Amharic. Since 2013 TM has returned to France, where she currently lives, and actively uses Amharic.

### 1.3 Amharic

Amharic (አማርኛ) is an Ethiosemitic language of the Southwestern Semitic Group spoken in Ethiopia, in the Horn of Africa (Kitchen et al., 2009). It is the most widely spoken language in the country, and the second most spoken Semitic language, after Arabic, with approximately 57 million speakers (Eberhard et al., 2022). Amharic is considered a fusional language that uses root vowel modifications and complex inflectional morphology to build words.

In Semitic linguistics, the term ‘root,’ as in the Semitic root of a word, usually corresponds to the term ‘stem’ in other areas of linguistics. In this paper, I have opted to maintain the usage of ‘stem’ to remain consistent with other literature on stress. The Semitic root consists of—usually, but not exclusively—three radicals. Radicals are the consonants that make up the Semitic root that convey the base meaning of a word. Within this root, the addition of, or changes to vowels may come as part of derivations or conjugations that alter the meaning of the word. For example, the Arabic root *k-t-b* can result in words such as *kataba* ‘he wrote,’ *yaktubu* ‘he writes,’ *kutub* ‘books,’ *maktab* ‘desk,’ etc. In these, the radicals are always present with different combinations of vowels and morphology to change meaning. Amharic largely functions in the same manner, especially with regards to verbs.

It is worth noting that in Amharic, both nouns and adjectives can be inflected for case, number, and definiteness (Leslau, 1995). As such, a valid word can consist of an adjective with suffixation to express these characteristics (e.g., /arəŋ<sup>w</sup>ade-otʃtʃ-u-n/ ‘green-PL-DET-ACC’).

The segment inventory of Amharic is presented below, in Tables Ia & Ib, adapted from Hayward & Hayward (1999). Phonemes in brackets are only found in loanwords, while a superscript ‘w’ in parenthesis indicates that the consonant may be labialised—albeit not contrastively. All consonants may be geminated, with the exception of /ʔ, h/; gemination is prevalent in every aspect of the morphology, and is also phonemic (Leslau, 1995: 11-12).

Table 1a. Consonant inventory of Amharic

	LABIAL			ALVEOLAR			PALATAL			VELAR			GLOTTAL
	-VOI	+VOI	EJECT	-VOI	+VOI	EJECT	-VOI	+VOI	EJECT	-VOI	+VOI	EJECT	-VOI
STOP	p	b <sup>(w)</sup>	p <sup>t(w)</sup>	t	d	t <sup>l(w)</sup>				k <sup>(w)</sup>	g <sup>(w)</sup>	k <sup>t(w)</sup>	ʔ
NASAL	m <sup>(w)</sup>			n			ɲ						
FRICATIVE	f <sup>(w)</sup>	[v]		s	z	s <sup>ʰ</sup>	ʃ	ʒ					h <sup>(w)</sup>
AFFRICATE						ts <sup>ʰ</sup>	tʃ	dʒ	tʃ <sup>ʰ</sup>				
APPROX		(w)			l			j			w		
RHOTIC					r								

Amharic has the following symmetric, 7-vowel inventory. Vowel length is not considered phonemic.

Table 1b. Vowel Inventory of Amharic

	FRONT	CENTRAL	BACK
HIGH	i	ɨ	u
MID	e	ə	o
LOW		a	

One final note on Amharic linguistics is the transcription conventions employed. Traditionally Amharicists use transcription conventions based on Semiticist transcriptions. These are rather distinct from IPA in the following ways. Additionally, not all authors on Amharic use the same transcription system, resulting in discrepancies between publications. In some instances the vowels /i/ and /ə/ are also not consistently transcribed, and some authors tend to use them in overlapping contexts. IPA has been used throughout this paper for transparency.

Table 1c. IPA vs Amharicist transcriptions

IPA	tʃ	dʒ	tʃʼ	ʒ	ɲ	j	kʼ	i	ə
Amharicist	č	j	čʼ	ž	ň	y	q	ĩ/ə	ä

#### 1.4 Groundwork for Current Investigation & Reassessment of Alemayehu (1987)

Alemayehu (1987) provides the account of Amharic stress that more closely aligns with the data and analysis of this research (for a more detailed description of his analysis, see Section 2). Both the data and research presented here expand on Alemayehu’s work and approach the data from a different perspective.

Alemayehu’s analysis of stress in isolation includes no acoustic data, which presents a problem his credibility. Notwithstanding, the data collected for this research seem to corroborate his conclusion, showing that verbal stems take stress (i.e., high pitch) on their penultimate syllable, while non-verbal stems take stress as close as possible to their

antepenultimate syllable—that is, initial stress for di- and trisyllabic stems, and antepenultimate for tetrasyllabic stems (see Section 4.1).

Within phrasal contexts, Alemayehu does present some acoustic data in the form of intonation contour displays (ICDs)—a sample ICD is shown below. However, he only includes four ICDs, each with different word lengths, syllable counts, and phrase lengths. This again presents a lack of credibility due to the severely limited amount of data.

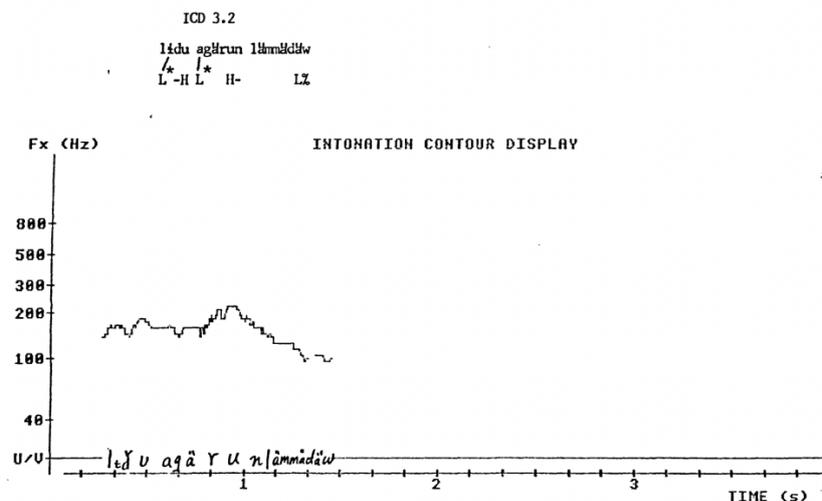


Figure 1. ICD for /lɪdʒu aɣərʊn ləmɛdɛw/ 'the boy got used to the place' (Alemayehu, 1987: 327).

This research has taken acoustic data as the primary evidence for the claims made, and has systematically analysed data from hundreds of elicitations to increase the statistical power of the conclusions drawn. A sample spectrogram, also of a three-word sentence, is shown below. Note that this sample includes a pitch track, which was examined for each elicitation, and contributed to the conclusions presented in this paper.

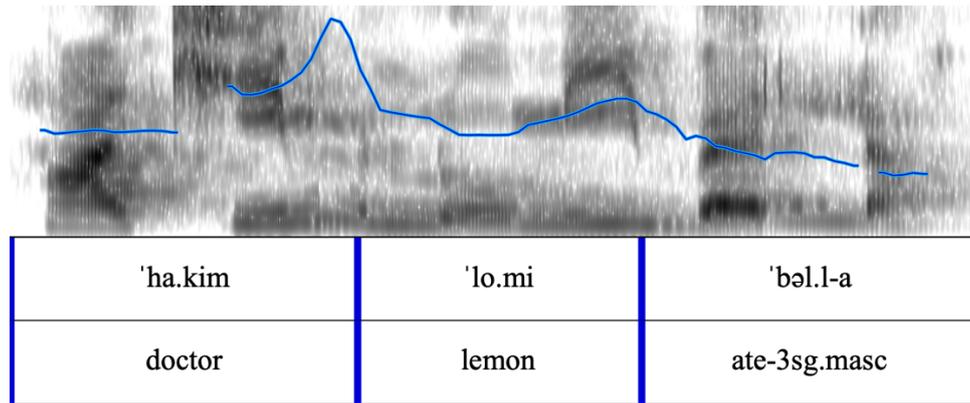


Figure 2. Spectrogram for /hakim lomi bəlla/ 'a doctor ate a lemon'.

Not only is the pitch track more clearly visible in this spectrogram (we cannot fault Alemayehu for the technology available in the late 80s), but thanks to the overlay of the pitch track on the spectrogram, it is also easier to pinpoint what segments or syllables a peak or valley align with.

Alemayehu's description of declarative sentences also includes different kinds of focus, topic, and illocutionary acts (such as conveying a sense of urgency, or accepting defeat). This research differentiates his different kinds of declarative phrases, and identifies only one of the five as being an assertive statement. The majority of phrasal data collected here is of declaratives of this sort; the small portion of focus data gathered shows that they do behave distinctly from other declaratives—both morphologically and intonationally—and should not be classified together.

Crucially, Alemayehu posits that stress, seen as a H\* in isolation, surfaces in phrasal declarative contexts as L\*. Data from declarative phrases shows that this is not the case. Rather, what we generally see is a) a stable, flat low pitch, with a final rise on the right edge of the phrase (see Figure 4); or b) in longer phrases, a slightly high pitch portion around the

second syllable, which then drops and remains low until the final right edge rise (see Figure 5). Alemayehu's proposal has been reanalysed into a system of phrasal boundary tones, in which pitch accent plays no role in the intonation (see Sections 4.2-4.3).

Despite the reanalysis of Alemayehu's stress in phrasal contexts, there are still a few important overlaps in his analysis and the one presented here. First, there is consensus that there *is* stress in isolation. Second, the position of stress is predictable. As mentioned above, stress surfaces as close as possible to the antepenultimate syllable of a non-verbal stem, and on the penultimate syllable of a verbal stem. These same conclusions are reached even though Alemayehu and this research took different routes to arrive there. Namely, one of Alemayehu's rules has been reinterpreted: he posits an extrametricality rule that applies to non-verbal stems, resulting in both verbs and non-verbs having penultimate stress, whereas I posit that his rule is unnecessary, with non-verbal stems retaining stress as close as possible to an antepenultimate position, and verbal stems still having stress on their penultimate syllable; his final conclusions remain consistent with my own.

On a final note, Alemayehu includes an example of a tetrasyllabic stem with two syllables worth of suffixes that he claims receives a L\* on its stressed syllable (in this case a bitonal pitch accent (PA), L\*-H): /zə.ná.zə.na-wotʃ.tʃ-u/ 'pestle-pl-det':

b) zən'ázə.nawočču (yáne naččāw) "the pestles (are  
 |  
 L\* - H mine)"

Figure 3. Sample sentence from Alemayehu (1987) with L\* on stressed syllable in phrasal context.

He proposes that the L\* portion of the PA aligns with the stressed syllable, while the H aligns with the final syllable of the word. Canonically, bitonal pitch accents do not span five syllables like Alemayehu proposes, but are found on adjacent syllables.<sup>1</sup> The data sample in Figure 4 shows that Alemayehu’s proposed pitch accent in phrasal contexts is not consistent with the expectations he sets forth (for further elaboration, see Sections 4.2-4.3). He predicts that the stressed syllable, /gə/, should carry a L tone, whereas we observe the pitch track remain low and stable for the first three syllables of the word before rising on the last.

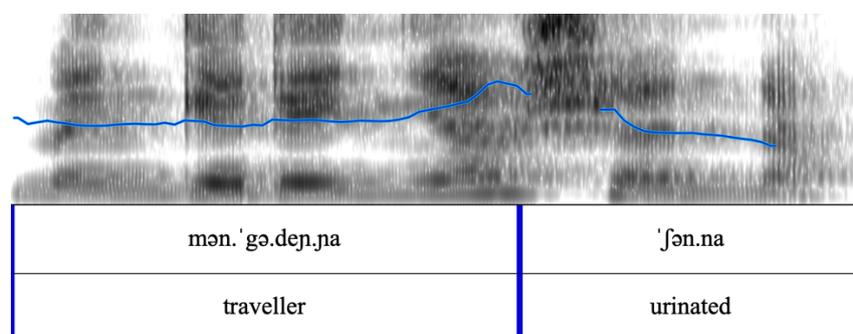


Figure 4. Spectrogram for /məngədəɪnə ʃənna/ ‘a traveller urinated’.

Additionally, Alemayehu also proposes the existence of a pre-final H- boundary tone, only found between the final and penultimate words of an utterance. The L\*-H PA in the previous example should not be interpreted as a L\* PA on the stressed syllable, followed by a H boundary tone primarily because of its location. Had Alemayehu provided tonal targets for the entire phrase, and not just the first word, his H- boundary tone would be between the words *yəne* and *nətʃtʃəw*. The data presented in this paper indicate the presence of a H phrasal boundary tone on the right edge of a phrase (see Sections 4.2-4.3).

<sup>1</sup> The instances of a L and H being separated by multiple syllables in the data gathered were in cases where each was a boundary tone, aligned to the left and right edges of a phrase, respectively.

On a tetrasyllabic word, as in Figure 4, he makes us expect a L\* on the second syllable, but the general trend is that there is no distinct low pitch aligning with the stressed syllable. In fact, the entire pitch track shows a low tone on all syllables except the word-final one. The other possible tonal pattern seen in tetrasyllabic words is shown in Figure 5, and directly goes against Alemayehu’s purported L\*.

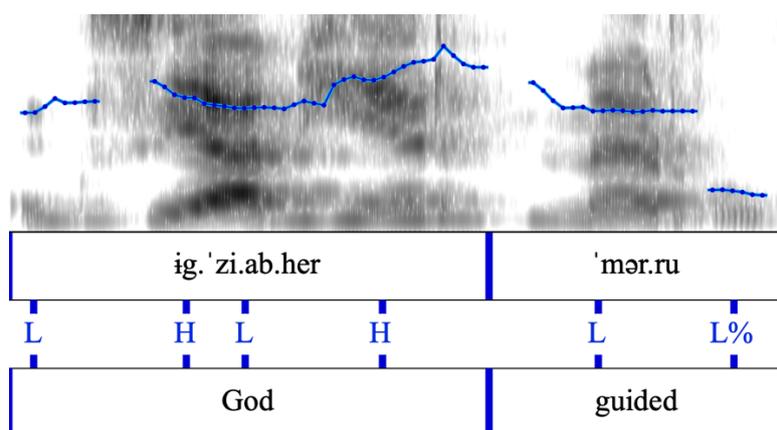


Figure 5. Spectrogram for /igziabher mərru/ ‘God guided’.

The antepenultimate syllable of ‘God’ is its stressed one, and shows a higher pitch than both the preceding and following syllables. This tonal pattern is triggered due to rhythmic reasons, and is further addressed in Section 4.3.3.

Further, longer APs also disprove Alemayehu’s argument for L\* in declarative phrases: there is no L\* on any non-initial word within longer APs that coincides with a stressed syllable. Instead, we see consistent low pitch on phrase medial syllables excluding the initial and final LH sequences, as in Figure 6. Another argument against positing L\* on stressed syllables in declarative phrases is illustrated by the first word in Figure 5. The possessive particle *jə-* attaches to the proper noun *Meaza*, whose first syllable carries stress in isolation. However, the pitch track below shows that the first syllable of *Meaza* carries a

higher pitch than the possessive particle. Should Alemayehu’s L\* proposal hold true, we would expect the inverse, with the first syllable of *Meaza* carrying lower pitch.

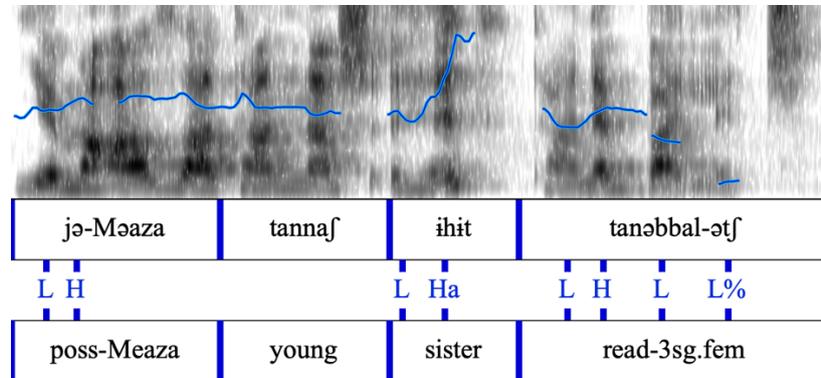


Figure 6. Spectrogram for /jəməaza tannaʃ ihit tanəbbalətʃ/ ‘Meaza’s young sister read’.

## 2 Background

In this section I will present a brief summary of the existing claims made about stress. Section 2.1 presents the domain and phonetic cues of stress of previous authors; Section 2.2 deals with claims of fixed and free stress positions. In Section 2.3 are proposals that see certain suffixes as altering stress; Section 2.4 details the purported stress shift many authors claim to observe. At the end of this section, in 2.5, is a table consolidating the claims made by each of the authors addressed in this section. Discussion on these claims in light of my data can be found in Section 5.

### 2.1 Domain & Phonetic Correlates of Stress

#### 2.1.1 Domain of Stress

In all discussions of Amharic stress there is a claim as to what the domain of stress is, whether overtly specified or not. What is meant by this is that in cases where an author fails

to specify what they consider to be the domain of stress, the domain has been assumed based on the examples provided and the location of stress in those examples. For example, if an author makes no specific claims, but shows there to be stress on a suffix, we assume that they consider the whole word to be the domain of stress.

Previous publications may be split dichotomously in terms of proposed domains of stress. One group of authors (Armbruster, 1908; Mullen, 1986; Sande & Heddig [S&H], 2017) have analyses that support a whole-word-as-domain approach to Amharic stress. The other authors (Alemayehu, 1987; Hudson, 1997; Leslau, 1995) specify that they consider the stem to be the only domain of stress; some refrain from commenting on the topic (Ullendorff, 1995), or adopt the analyses of others for their discussions (Sande et al., 2019—adopt Mullen’s and S&H’s analyses).

#### 2.1.1.1 Domain: Word

Armbruster’s (1908) analysis of stress does not explicitly state what he believes the domain of stress to be. At first glance, his examples seem to show stress on stems only, but throughout his book there are multiple instances of words marked with stress outside their stem as in /**mə.lək.t**-əŋ.ŋa/ ‘messenger’ (Armbruster, 1908: 39). For clarity, stems are shown in boldface text. The word for ‘messenger’ is derived from the word for ‘message’ /**má.lik**t/, with the addition of the suffix /-əŋŋa/ ‘person associated with X’ (Mullen, 1986: 183). Further

examples of Armbruster's that show the entire word to be the domain of stress may be found in Section 2.2.2.

Similarly, Mullen (1986) never specifies what she considers the domain of stress to be, but provides multiple examples of stress carried by non-stem syllables: /**din.ga.j**-ám.ma/ 'stony'<sup>2</sup> and /**k'ur.tʃim.tʃi.mi.t**-ótʃ.tʃ-e/ 'ankle-PL-POSS.1SG (my ankles)' (Mullen, 1986: 165, 183).

Unlike Armbruster and Mullen, S&H state '[s]tress is word-level, and does not distinguish affixes from stems' (S&H, 2017: 6). Not only do they describe their domain of stress, but provide a contrastive 'near minimal pair' as an example: /mǎ-**tʃuh**/ 'to yell' but /**tʃú**-hət/ 'a yell' (S&H, 2017: 6). Rather than the domain of stress being assumed, they describe it because it is crucial to their proposed analysis, as described in Section 2.2.2.

#### 2.1.1.2 Domain: Stem

Despite there being a few authors who state that the stem is the domain of stress, only Alemayehu presents an analysis of stress that is dependent on the stem being the exclusive domain of stress. Hudson merely mentions that 'main stress of words is typically audible on stems rather than affixes' with the possible exception of the plural suffix as possibly being stressed (Hudson, 1997: 460). The basis for his claim is unknown as he provides no examples or further reasoning. It is also not uncommon for certain suffixes to be given a

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<sup>2</sup> Literally: 'pertaining to stone' → /dingaj/ 'stone' + /-amma/ 'pertaining to' (Mullen, 1986: 183).

more ‘prominent’ status when it comes to stress. In Section 2.3, I address the different suffixes that various authors claim can attract/shift stress (with the exception of the plural suffix, as Hudson provides no data to work with). Along a similar vein, Leslau suggests that ‘in principle the stress is connected with the root and not with the affixes,’ as in /**dəf.fə.r**-ətʃ/ ‘she was intrepid,’ ‘one also finds occurrences [...] where the syllable preceding the suffix -ነት -*nnät* is stressed’ such as in /**dəf.fə.r**-ín.nət/ ‘temerity’ (Leslau, 1995: 45). The exception presented by the suffix /-*nnət*/ aside, every example of Leslau’s shows stress to be on the stem of the word.

As with S&H, Alemayehu’s analysis hinges on the domain of stress being specified and all the stress assignment occurring exclusively within that domain. For Alemayehu, however, the domain of stress is strictly limited to the stem, and there are no exceptions to this proposition; stress is *always* found on the stem (Alemayehu, 1987: 103-104).

### 2.1.2 Phonetic Correlates of Stress

Any investigation of stress ought to include some indication of what phonetic cues are being interpreted as demarcating the stressed syllable. The phonetic correlates of stress used by S&H are pitch and intensity (S&H, 2017: 5), while Sande et al. (2019: 3805) reassesses the only relevant phonetic correlate of stress to be intensity, based on a logistic regression model.

In contrast, Alemayehu's (1987) analysis goes at length to describe stress as being associated with pitch (Alemayehu, 1987: 54, 60-65). The certainty with which he considers pitch to be the cue to stress is also evident in that he refers to stress as 'high pitch' and the assigning of 'stress' is called the assigning of 'high pitch.'

Unfortunately, other authors do not overtly mention what they believe the phonetic cues of stress to be. Based on Mullen and Leslau's accounts of stress, one may hypothesise that they could be referring to stress in terms of the location of a high pitch, but they never qualify what stress is demarcated by. The cases made by Armbruster, Hudson, and Ullendorff yield even less information, and do not make it possible to ascertain what demarcates a stressed syllable under their analyses or observations.

## 2.2 Fixed vs Free Stress

All accounts of Amharic stress can be categorised based on whether they suggest there is a fixed position for stress—i.e., it is predictable, or a 'free' position—i.e., there is variation in the location of stress, and is not predictable. The former are represented by Alemayehu (1987) and Leslau (1995), although with a small exception in trisyllabic words for Leslau, see Section 2.2.1. The latter category consists of Armbruster (1908)—who proposes fixed stress for verbs but shows examples that contradict this (see examples of verbs with stress on suffixes, but not on their stems in Section 2.2.2 below), Mullen (1986), and S&H (2017), presented in Section 2.2.2.

### 2.2.1 Fixed Stress

Stress with a fixed position is explicitly addressed by Alemayehu, and to some extent by Leslau. A crucial differentiation for the former is that verbs and non-verbs are assigned stress to different positions. Although Leslau does not formalise this notion, the way he presents examples implies that this is true to some extent. Given the differentiation of verbs and non-verbs, I present the analyses of verbs first, followed by non-verbs.

Leslau's support of fixed stress in verbs is somewhat implicit. He specifies the 'syllable preceding a geminate is likely to be stressed' (Leslau, 1995: 45), and exclusively provides examples of *verbs* that demonstrate this without further elaborating on the topic or showing this to be the case with any non-verbs: /fəl.lə.g-ə/ 'he wanted,' /fə.ləl.lə.g-ə/ 'he wants repeatedly,' /mə.sək.kə.r-ə/ 'he testified' and /ji.-mə.sək.kir/ 'he was testifying' (Leslau, 1995: 45).

Alemayehu, on the other hand, is very explicit in the differentiation of verbs from non-verbs. He proposes that all verbs take stress on the penultimate syllable of their stem (Alemayehu, 1987: 69-73). The majority of Amharic verb stems are di- or trisyllabic, but may be extended by infixes such as a reduplicative infix that indicates repetition of an action (Alemayehu, 1987: 73). Alemayehu's analysis is able to account for the extension of a verb stem by suggesting the location of stress shifts to accommodate the additional syllable in the stem: /səb.bə.r-ə/ 'broke-3sg.masc' → /sə.bəb.bə.r-ə/ 'broke repeatedly-3sg.masc' and

/mə.náz.zə.r-ə/ ‘changed money-3sg.masc’ → /mə.nə.záz.zə.r-ə/ ‘changed money repeatedly-3sg.masc’ (Alemayehu, 1987: 72). In both versions of each stem, the stressed syllable is still seen to be the penultimate syllable of the stem (which happens to be the antepenultimate syllable of the word in all cases—this is addressed in Section 4.1). Unlike the analysis of Leslau, Alemayehu’s is consistent and fully predictable in its assignment of stress, regardless of the shape of a verb. While the penultimate syllable of the stem often coincides with the syllable preceding a geminate, Leslau does not mention how stress is assigned in verbal forms that have no geminates, such as the participle for some verb types, or in verbal forms where more than one geminate may be present.

Regarding non-verbal words, Leslau has a stress pattern with more variation than the one Alemayehu proposes (see below). He proposes initial stress for disyllabics (e.g., /sáj.ɲo/ ‘Monday’ and /sí.ga/ ‘flesh’), initial or peninitial for trisyllabics (e.g., /sá.mu.na/ ‘soap’ and /tə.rá.kəz/ ‘variegated’), and penultimate for tetrasyllabics (e.g., /zə.nə.zə.na/ ‘pestle’ and /a.rən.g<sup>w</sup>á.de/ ‘green’) (Leslau, 1995: 44-45). Initial stress on trisyllabic words aside, Leslau proposes relatively consistent penultimate stress. The shortcomings to his (mostly) penultimate system lie in that he does not specify why stress falls on the syllables it does, or how we know that some trisyllabic words carry stress on an initial position, while others do so on the penultimate syllable.

In contrast, Alemayehu provides a detailed account of non-verbal stems all having antepenultimate stress (or as close to as possible in the case of disyllabic words), without any

exceptions (Alemayehu, 1987: 73-74). Alemayehu actually proposes an extrametricality rule that only applies to non-verbs and results in across the board penultimate stress on all stems. He does this to avoid having antepenultimate stress on tri- and tetrasyllabic words, but penultimate stress on disyllabic words. Reinterpreting his analysis for non-verbs as an all antepenultimate system in which disyllabics take stress on the closest syllable to antepenultimate position (i.e., initial/penultimate) seems a cleaner way of illustrating his proposed stress system. This holds true for stems with lengths of two, three, and four syllables: /sá.ga/ ‘long thin stick’ and /wám.bər/ ‘chair;’ /sá.mu.na/ ‘soap’ and /wá.rə.k’ət/ ‘paper;’ /zə.ná.zə.nə/ ‘pestle’ and /in.ǰi.la.lit/ ‘lizard’ (Alemayehu, 1987: 73). Unlike Leslau’s stress pattern, that of Alemayehu is consistent and predictable. Not only does he propose that stress is always antepenultimate or as close to as possible, but there are no exceptions as in Leslau’s trisyllabic words or his stress-attracting suffix, shown earlier in Section 2.1.1.2.

### 2.2.2 Free Stress

As mentioned earlier, Armbruster proposes an alleged fixed stress pattern for verbs, while his non-verbal stress pattern is rather free. Unlike Mullen and S&H, his overarching suggestions are not influenced by weight. Therefore, I will address non-weight-related free stress before presenting the weight-based analyses of Mullen and S&H.

Armbruster posits that, specifically in verbs, stress always falls on the syllable preceding the doubled radical—i.e., the geminate (Armbruster, 1908: 37). For example,

/mə.náz.zə.rə/ ‘he changed’ and /gǎb.ba/ ‘he entered’ (Armbruster, 1908: 37-38). However, when presenting the typical verbal paradigm of Amharic verb types there are instances in which Armbruster shows examples with more than one geminate, only one of which is a radical, and shows no stress on the doubled radical, but instead on a syllable that is part of a suffix (e.g., /fəl.lə.g-átʃ.tʃi.hu/ ‘you(pl.) wanted’—the radicals of this verb are *f-l-g*, all other consonants are not radicals.) (Armbruster, 1908: Section 35). Armbruster also provides examples of geminates explicitly outside the verbal stem, and indicates that these have stress preceding them as well: /lək.k’ə.m-átʃ.tʃi.hun.nal/ ‘you(pl.) have picked’—this verb has the radicals *l-k-m* (Armbruster, 1908: Sections 34–35).

Verbal forms aside, Armbruster observes that stress seems to be in free variation. He provides examples of disyllabic words with initial *and* final stress (e.g., /ʃúr.raj/ ~ /ʃur.ráj/ ‘sock’ and /mál.kam/ ~ /məl.kám/ ‘excellent’), and trisyllabic words with initial or secondary stress as in /mǎ.lə.da/ ~ /mə.lǎ.da/ ‘early’ and /gǎ.bə.lʷo/ ~ /gə.bá.lʷo/ ‘gecko;’ initial and final stress is also a possibility: /wí.ʃə.tam/ ~ /wi.ʃə.tám/ ‘false’ and /dǎ.rə.tam/ ~ /də.rə.tám/ ‘broad-chested’ (Armbruster, 1908: Section 8). Interestingly, the possibility of having stress on any of the three syllables is not discounted. Armbruster shows /mǎ.sə.lal/ ~ /mə.sǎ.lal/ ~ /mə.sə.lál/ ‘ladder’ all as acceptable variants of the word (Armbruster, 1908: 48). The variation in stress observed by Armbruster is not given a source; he merely mentions that a word carries stress on a given syllable, and that sometimes it is carried on another.

The analyses of Mullen and S&H stand in stark contrast to Armbruster's primarily because their proposals do not include stress in extreme free variation as Armbruster suggests. Both provide a default stress pattern and reasons for why the location of stress might deviate from said pattern.

Mullen proposes a stress system in which there is no final stress, the right-most heavy syllable is stressed, or otherwise, the left-most light syllable is stressed (i.e., default initial stress). The only exception is with disyllabic words, in which a heavy final syllable is allowed to be stressed iff the first syllable is not also heavy: /fə.káád/ 'permission' but /mán.gəd/ 'road' (Mullen, 1986: 165). Some of Mullen's crucial points and assumptions are (respectively) that (i) the final consonant is considered extrametrical, further enforcing a system with no final stress; (ii) Amharic has long vowels<sup>3</sup>—as such a heavy syllable under Mullen's account is either closed, CVC, or has a long vowel, CVV(C). The effect of a medial heavy syllable on a trisyllabic word can be seen in the near minimal pair /nég.gə.d-ə/ 'he traded' and /nə.gáá.de/ 'merchant' (Mullen, 1986: 165). Mullen shows her right-most heavy syllable proposal through a shift in stress from words like /k'ur.tʃim.tʃi.mit/ 'ankle' with secondary stress, to words like /k'ur.tʃim.tʃi.mi.t-ótʃ.tʃ-e/ 'my ankles' with penultimate stress on the fifth syllable. In 'my ankles' the syllable /totʃ/ replaces /tʃim/ as the right-most heavy syllable, and now carries stress (Mullen, 1986: 168).

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<sup>3</sup> n.b. Mullen (1986) contains the only mention of Amharic having long vowels. All other publications consider all Amharic vowels to be 'equal' in terms of duration.

Along a similar vein, S&H also propose a stress system that defaults on initial stress. Their default pattern consists of left-aligned, binary, trochaic feet, with no final stress. This means that S&H allow for multiple stresses per word as they show in cases like /wɪʃ.ʃa.ótʃtʃ/ ‘dogs’ and /ás.da.ká.kəl.ku/ ‘I arranged’ (S&H, 2017: 6-8). With regards to foot formation (denoted by parentheses), S&H posit that they align to syllables closed by geminates (e.g., /ji.(səb.ra).(wəl)/ ‘he will break something’ and /k’o.(fí.ja).(ótʃtʃ)/ ‘hats’). Feet also form around geminates, as in /tə.(gág.gə).rə.(wál.litʃ)/ ‘she will bake it’ and /i.(fəl.li).ga.(tál.la).hu/ ‘she needs me’ (S&H, 2017: 8). A similar proposal is made by only one other author, Armbruster, who claims there is secondary stress before *and* after a doubled consonant, or two consecutive consonants, which may or may not coincide with primary stress—he only provides examples with stress before said context, not after (Armbruster, 1908: 36-37). S&H differ from Armbruster in that they posit there is ‘no acoustic reason to think that one stressed syllable carries primary stress and the others secondary’ (S&H, 2017: 6).

A key point to their analysis is that any aspect of their default pattern may be overridden or altered by the presence of a heavy syllable; only syllables closed by a geminate are heavy, and all others are light. A heavy syllable may cause there to be final stress and/or no initial stress (e.g., /se.tótʃtʃ/ ‘women’ and /tʃ’á.rəs.wáll/ ‘he finished’), and stress clash(es) (e.g., /bál.látʃ.tʃih<sup>w</sup>/ ‘you(pl.) ate’ and /lám.mín.nát.tə.mám.mə.néb.bət/ ‘to him in whom we believe’) (S&H, 2017: 7). An implication of this claim is that there is a theoretical limit to the number of stresses ( $\acute{\sigma}$ ) a word with  $n$  number of syllables may have:  $n = \acute{\sigma}$ . In other words, the

maximum theoretical number of stresses a given word may have under a S&H analysis is equal to the number of syllables if they were all to be closed by a geminate (e.g., C'VG.C'VG.C'VG.C'VG).

S&H also propose that a heavy syllable (CVG) will emanate stress in both directions in an alternating fashion (S&H, 2017: 8). In other terms, if we take a five syllable word, with all light syllables except its third, to be closed by a geminate (CV.CV.C'VG.CV.CV), S&H posit that the third syllable would be stressed, and so would the first and fifth—with the fifth being considered extrametrical, and not showing stress ('CV.CV.'C'VG.CV.CV).

Although Armbruster, Mullen, and S&H all posit analyses of 'free' stress, they largely differ in how they explicate the surfacing of the proposed stress pattern. There is disagreement in the number of allowed stresses per word, as well as what a heavy syllable is, and how weight affects the distribution of stress. In short, the position of free stress can depend on syllable weight (Mullen, S&H), or may be found in free variation (Armbruster), whereas fixed stress has a position that is always predictable based on the morphological shape of the stem of a word.

### 2.3 Stress-Attracting Suffixes

Suffixes that attract stress were briefly mentioned in passing earlier, as in Section 2.1.1. Authors like Armbruster, Hudson, and Leslau each mention one specific suffix that they believe consistently attracts stress in some way. For Armbruster, this is the suffix /-ɲna/, an

adjectival ending as in /amar-íŋŋa/ ‘Amharic’ and /mirk<sup>w</sup>ó-ŋŋa/ ‘prisoner’ (Armbruster, 1908: 50). In the case of ‘prisoner’ we know that stress is on the initial vowel in the absence of the suffix since it is the only other available vowel, but Armbruster does not specify where in /amara/ we would find stress prior to the addition of the suffix. Both Hudson and Leslau are less certain about a shift of stress caused by suffixes. Hudson mentions in a parenthetical that ‘the plural suffix may be stressed’ (Hudson, 1997: 460), but provides no examples. Leslau’s single example is that seen in Section 2.1.1, where the suffix /-nnət/ moves stress from /dáf.fə.rətʃtʃ/ ‘she was intrepid’ to /dáf.fa.r-ín.nət/ ‘temerity’ (Leslau, 1995: 45). He provides no indication of whether this is the case in all occurrences of this suffix, or if there may be other suffixes that have a similar effect.

Once again we see that Mullen and S&H have proposals that align with each other. Mullen considers the suffixes /-amma/ ‘pertaining to,’ /-əŋŋa/ ‘person associated with,’ and /-innət/ ‘activities associated with’ to all attract stress to the right from a leftward position (Mullen, 1986: 183). For S&H these three suffixes *and* the plural suffix /-otʃtʃ/ all have an effect of stress by virtue of their geminate. In Section 2.1.1 we saw the change in stress position with /-amma/, from /dín.gaj/ ‘stone’ to /din.ga.j-ám.ma/ ‘stony.’ The effects of the other suffixes, which may be stacked onto each other, are demonstrated by Mullen with the following derivations (Mullen, 1986: 183):

/már.kəb/ ‘ship’ → /mər.kə.bəŋŋa/ ‘sailor’ → /mər.kə.bəŋŋán.nət/ ‘shipping’

A point of contention between these two authors is that while Mullen only has one stress on ‘shipping,’ S&H would illustrate the stresses of the word as /mər.kə.bəj̃.nán.nət/.

## 2.4 Changes in Stress

There is consensus between Alemayehu, Leslau, and Mullen that there is some sort of stress shift in compounds or phrases of two very closely related words, as with a noun and a copula.

This happens specifically with compounds for Alemayehu, where stress shifts to the final syllable of the first constituent in a compound. He shows this to be the case in compounds with words of varying syllable lengths: /ba.hír zaf/ ‘eucalyptus tree,’ /lǐbb wol.ləd/ ‘fiction,’ /be.tá ki.ris.ti.jan/ ‘church,’ and /mən.fə.sá t’ən.kar.ra/ ‘determined’ (Alemayehu, 1987: 93). Alemayehu does propose that in declarative sentences, there is no stress shift, but rather, the H\* he posits for single words becomes a L\* in these contexts. Mullen shows agreement with Alemayehu, and provides a few examples of the same shift of stress in what she calls “ as in /ɪk’/ ‘object’ → /i.k’á bet/ ‘storehouse (object+house)’ (Mullen, 1986: 194).

Leslau and Mullen agree with each other and identify the context of this stress shift as two-word phrases of closely related words, specifically a word + the copula. The nature of the first word is flexible. It may be a noun as in /tə.má.ri/ ‘student’ → /tə.ma.rí nəw/ ‘he is a student’ (Leslau, 1995: 45) and /lǎb.ba/ ‘thief’ → /lǎb.bá nəw/ ‘he is a thief,’ or an adjective

as in /tʃn.nɪʃ/ 'little' → /tʃn.nɪʃ nat/ 'she is little,' or a wh-word like in /má.tʃe/ 'when' → /mə.tʃé nəw/ 'when is it' (Mullen, 1986: 194). These claims will be addressed in Section 5.

## 2.5 Comparative Table

Below is a table consolidating the claims made by each of the authors addressed in this section. This table includes acoustic correlates of stress, their main claims, and numbered examples that correspond to each numbered claim. Authors are presented chronologically.

TABLE . CLAIMS OF EACH AUTHOR WITH EXAMPLES & IDENTIFIERS OF STRESS

AUTHOR	ACOUSTIC CORRELATES OF STRESS	STRESS CLAIMS	DISYLLABIC* WORDS	TRISYLLABIC WORDS	TETRASYLLABIC+ WORDS	EXAMPLES
Armbruster (1908)	- Unspecified	<ol style="list-style-type: none"> <li>Secondary Stress before a doubled consonant or two consecutive consonants. <ul style="list-style-type: none"> <li>Principal stress may be elsewhere.</li> </ul> </li> <li>Di- and trisyllabic words have initial secondary, or final stress (it is not fixed).</li> <li>Claims /-ŋna/ shifts stress to syllable preceding suffix from original position.</li> <li>In verbs, stress falls on the syllable preceding the doubled radical.</li> </ol>	<p>Initial or secondary stress. No reasoning for variation provided.</p> <p>/dáh.na/ ~ /dəh.ná/ 'well'</p> <p>/tí.niŋ/ ~ /ti.níŋ/ 'mosquito'</p>	<p>Initial, secondary, or final stress. No reasoning for variation provided.</p> <p>/má.lə.da/ ~ /mə.lə.da/ 'early'</p> <p>/wí.ʃə.tam/ ~ /wi.ʃə.tám/ 'false'</p>	No claims or examples provided.	<ol style="list-style-type: none"> <li>/áb.ba.láb.biŋ/ 'he lied to me'; /á.gív.t<sup>w</sup>al/ 'he has taken in'</li> <li>/gǎ.bə.l<sup>w</sup>o/ ~ /gə.bǎ.l<sup>w</sup>o/ 'gecko'; /ʃúr.raj/ ~ /ʃur.ráj/ 'sock'</li> <li>/á.ma.ra/ 'Amhara' → /a.ma.ríŋ.na/ 'Amharic.'</li> <li>/gǎb.ba/ 'he entered' /lák'.k'əmə/ 'he picked' /mə.nǎz.zə.rə/ 'he changed'</li> </ol>

\* In cases where verbs are specifically discussed, namely Alemayehu (1987), these headings refer to the number of syllables in a verb stem.

Ullendorff (1955)	- Unspecified. Seems like pitch from description.	- Unstable stress. - Sentence accent > word accent. - No accent & pitch is insignificant.	--	--	--	Provides no examples.
Mullen (1986)	- Unspecified. Likely using pitch as an indicator, but this is not explicitly mentioned.	- Stress is 'weak' but evident. - Final C (and sometimes whole $\sigma$ ) is considered extrametrical. 1. Right-most heavy syllable is stressed. 2. Absent a heavy syllable, the left-most light syllable is stressed. - Heavy syllables are closed by a C or have a long vowel (no one else claims the existence of long vowels in Amharic). 3. Suffixes can cause a shift in stress location, as can close association with a	Heavy final syllable is stressed if first syllable is not heavy. Otherwise, left-most light syllable is stressed (or left-most heavy if both are heavy).  /wə.dááj/ 'friend' /sə.bátt/ 'seven'  /sím.mínt/ 'eight'  /fǎ.rəs/ 'horse' /sí.ga/ 'meat'  (n.b. in all these the final C is extrametrical.)	Right-most heavy syllable is stressed – no final stress. Otherwise, left-most light syllable is stressed.  /tə.máá.ri/ 'student' /nǎg.gə.də/ 'he traded' /nə.gáá.de/ 'merchant'  /má.lə.kət/ 'bugle' /fǎ.rə.sotʃtʃ/ 'horses'  (n.b. in all these the final C is extrametrical.)	Right-most heavy syllable is stressed – no final stress. Otherwise, left-most light syllable is stressed.  /mǎ.lə.kə.te/ 'my bugle' /li.dzǎá.gə.rəd/ 'girl' /k'ur.tʃím.tʃi.mi.tótʃ.tʃe/ 'my ankles'  (n.b. in all these the final C is extrametrical.)	1. /fə.káád/ 'permission'; /tə.máá.ri/ 'student'; /nə.gáá.de/ 'merchant'; /k'ur.tʃím.tʃi.mít/ 'ankle' 2. /bét/ 'house' → /bé.totʃtʃ/ 'houses' → /be.tótʃ.tʃu/ 'the houses' 3. /mǎr.kəb/ 'ship' → /mər.kə.bəŋ.na/ 'sailor' → /mər.kə.bəŋ.nán.nət/ 'shipping' /tín.níʃ/ 'small' → /tín.níʃ nat/ 'she is small' /mǎ.tʃe/ 'when' → /mǎ.tʃé nəw/ 'when is it' /lǎb.ba/ 'thief' → /lǎb.bá nəw/ 'he is a thief'

		following word, such as a copula.				
Alemayehu (1987)	- Uses pitch as indicator for stress, namely H* in isolation forms, L* in phrasal forms.	<ul style="list-style-type: none"> <li>- Stems are the domain of stress.</li> <li>- H* indicates stress in monowordal utterances.</li> <li>- L* indicates stress in declarative utterances.</li> <li>- Differentiates between noun and verb stems.</li> </ul> <ol style="list-style-type: none"> <li>1. In verbs: penultimate stress.</li> <li>2. In nouns: initial stress in 2 and 3 syllable words.</li> <li>3. Antepenultimate stress in 4 syllable words.</li> <li>4. In compounds claims stress shifts to the last syllable of the first word.</li> </ol>	<p>Verbs: Penultimate stress.</p> <p>/fál.lə.g-ətʃʃ/ 'she wanted' /tə.fál.lə.g-ətʃʃ/ 'she was wanted'</p> <p>Nouns: Initial stress.</p> <p>/sá.ga/ 'long thin stick' /wám.bər/ 'chair'</p>	<p>Verbs: Penultimate stress.</p> <p>/mə.náz.zə.r-ə/ 'he changed money' /mə.nə.záz.zə.r-ə/ 'he changed money repeatedly'</p> <p>Nouns: Initial stress.</p> <p>/sá.mu.na/ 'soap' /wá.rə.k'ət/ 'paper'</p>	<p>Verbs: no stems with four syllables, but presumably still be penultimate.</p> <p>Nouns: Antepenultimate stress.</p> <p>/zə.ná.zə.nə/ 'pestle' /in.ʃí.la.lit/ 'lizard'</p>	<ol style="list-style-type: none"> <li>1. /gád.də.l-u/ 'they killed'; /tə.-gád.də.l-u/ 'they were killed' /gə.láb.bət'-u/ 'they overturned'; /tə.-gə.láb.bət'-u/ 'they were overturned'</li> <li>2. /sá.ga/ 'long thin stick'; /wám.bər/ 'chair'; /sá.mu.na/ 'soap'; /wá.rə.k'ət/ 'paper'</li> <li>3. /zə.ná.zə.nə/ 'pestle'; /in.ʃí.la.lit/ 'lizard'</li> <li>4. /ba.hír zaf/ 'eucalyptus tree'; /lǐbb wol.ləd/ 'fiction'; /wu.há gəbb/ 'irrigable'</li> </ol>

Leslau (1995)	<ul style="list-style-type: none"> <li>- Unspecified. Seems to be using pitch as well.</li> </ul>	<ul style="list-style-type: none"> <li>- Last syllable is not stressed.</li> <li>1. Syllable preceding a geminate is likely stressed.</li> <li>2. Initial stress in disyllabic nouns.</li> <li>3. Stress in trisyllabic nouns varies between initial and secondary.</li> <li>4. Tetrasyllabic nouns have penultimate stress.</li> <li>5. Stress is connected to the stem (but /-nnət/ attracts stress – like the claim about /-ɲna/).</li> <li>6. Hints at stress shift in compounds/closely related words in a phrase.</li> </ul>	<p>Initial stress.</p> <p>/sɔ̃ɲ.no/ ‘Monday’ /sɛ̃n.de/ ‘wheat’</p>	<p>Varies between initial and secondary stress.</p> <p>/sá.mu.na/ ‘soap’ /tə.ré.kəz/ ‘variegated’</p>	<p>Penultimate stress.</p> <p>/zə.nə.zá.na/ ‘pestle’ /a.rən.g<sup>w</sup>á.de/ ‘green’</p>	<ol style="list-style-type: none"> <li>1. /fál.lə.gə/ ‘he wanted’ /fə.lál.lə.gə/ ‘he wants repeatedly’ /mə.sák.kə.rə/ ‘he testified’</li> <li>2. /sɛ̃n.de/ ‘wheat’ /wám.bər/ ‘chair’</li> <li>3. /sá.mu.na/ ‘soap’ /tə.má.ri/ ‘student’ /zɛ̃n.g<sup>w</sup>ír.g<sup>w</sup>ír/ ‘variegated’</li> <li>4. /zə.nə.zá.na/ ‘pestle’ /a.rən.g<sup>w</sup>á.de/ ‘green’</li> <li>5. /dóf.fə.rətʃtʃ/ ‘she was intrepid’ → /dəf.fa.rín.nət/ ‘temerity’</li> <li>6. /tə.má.ri/ ‘student’ → /tə.ma.rí nəw/ ‘he is a student’</li> </ol>
Hudson (1997)	<ul style="list-style-type: none"> <li>- Unspecified, mentions ‘auditory prominence’ only.</li> </ul>	<ul style="list-style-type: none"> <li>- Stress is not prominent, but it shows on stems only.</li> </ul>	--	--	--	Provides no examples.

		<ul style="list-style-type: none"> <li>- Suggests the plural suffix may be stressed.</li> <li>- Admits there is little research on the topic.</li> </ul>				
Sande & Heddig (2017)	- Pitch and intensity.	<ul style="list-style-type: none"> <li>- Only syllables closed by geminates are heavy.</li> <li>- Stems <i>and</i> affixes are the domain of stress.</li> </ul> <ol style="list-style-type: none"> <li>1. Default: left-aligned, binary, trochaic feet, with no final stress.</li> <li>2. All heavy syllables are stressed (no real distinction between primary and secondary stress).</li> <li>3. Geminates attract stress, and can disrupt the default pattern.</li> </ol> <ul style="list-style-type: none"> <li>- Stress spreads from geminates in an alternating fashion.</li> </ul>	<p>Left-aligned, binary, trochaic feet, with no final stress. Heavy syllables always stressed.</p> <p>/mát'.fat/ 'vanish' /dó.ro/ 'chicken'  /se.tótʃʃ/ 'women'</p>	<p>Left-aligned, binary, trochaic feet, with no final stress. Heavy syllables always stressed.</p> <p>/mát.rəf.rəf/ 'overflow' /k'ó.fi.ja/ 'hat'  /wíʃ.ʃa.ótʃʃ/ 'dogs' /mə.tʃám.mər/ 'add an ingredient' /bál.látʃ.tʃih<sup>w</sup>/ 'you(pl) ate'</p>	<p>Left-aligned, binary, trochaic feet, with no final stress. Heavy syllables always stressed.</p> <p>/t'á.rə.p'é.za/ 'table' /ás.da.ká.kəl.ku/ 'I arranged'  /k'o.fi.ja.ótʃʃ/ 'hats'</p>	<ol style="list-style-type: none"> <li>1. /dó.ro/ 'chicken' /mát.rəf.rəf/ 'to overflow' /máʃ.kə.dá.dəm/ 'to race' /ás.da.ká.kəl.ku/ 'I arranged' /jə.tə.kə.fə.tá.wɪn bɪr/ 'the open door'</li> <li>2. /se.tótʃʃ/ 'women' /wíʃ.ʃa.ótʃʃ/ 'dogs'</li> <li>3. /íj.ja.tát.t'ál.lál.látʃ.tʃih<sup>w</sup> nəw/ 'you(pl) are hating each other' /lám.mín.nót.tə.mám.m ə.nəb.bət/ 'to him in whom we believe'</li> </ol>
Sande et. al (2019)	- Intensity is the only	- Found syllables that there are neither fully	--	--	--	Provides no examples.

relevant cue  
for stress.

stressed nor  
unstressed.

- Propose that what we call stress could be a combination of competing pressures for prominence.

### 3 Methodology

The data for this research were all remotely collected. Communication with my speaker was primarily via email or WhatsApp, using Zoom whenever there was something lengthier to discuss. This was the main dynamic adopted due to the time zone difference between California and France. She was provided with words and sentences in English, and instructed to translate them to Amharic as she was recording using Audacity. All stimuli for recording were presented in a randomised order. Once recorded, my consultant would upload all recordings to a Google Drive folder, after which they were partitioned into individual stimuli with text grids.

The initial approach was to elicit data from the examples provided by previous publications on Amharic stress, primarily because of the lack of consensus between some sources as to the location of stress, and because the location of ‘stress’ for these words is allegedly known. These consisted predominantly of tri- and tetrasyllabic words. The other types of single word data included noun stems of varying syllable length, these same nouns + plural suffix, and with plural + determiner. These nouns were also elicited preceded by a preposition, and others as pairs of bare stems and their nominalised/adjectivised counterparts. Verbs with two and three syllable stems were elicited, first in citation form (3SG.MASC perfective), for direct comparison with other authors’ claims, and then their participles were also collected to provide a verbal form without a geminate in the stem and

account for the possibility of Weight-to-Stress (WSP). Examples of all elicitation words may be found in Table III.

Sentence data mostly consisted of declarative phrases, and all were in standard Amharic SOV word order. Sentences ranged from two to four words, with variation in the length of each word (e.g., three word sentences of the syllable structures ranging from 2-2-2 to 3-3-3 in every possible combination). Longer sentences with multiple adjectives modifying the same noun were also elicited to determine the effect of longer NPs. The syntactic relations between elements of a sentence in terms of intonation were also explored through four-word sentences with different syntactic groupings. There were sentences with a one-word subject plus a three-word VP (1+3), a two-word subject plus a two-word VP (2+2), and a three-word subject plus a one-word VP (3+1). Corrective focus data was also collected to determine whether stress is present in the intonation of these constructions. My consultant was presented with a sentence for context (e.g., 'Meaza bought a *beautiful* house. '), and recorded the corrected sentence as if responding to the first sentence (e.g., 'No, Meaza bought an *ugly* house. '). Examples of each type of data may be found in Table III, below.

Recordings were segmented in *Praat*, and utterances were labelled with transcriptions and corresponding glosses. Utterances consisting of more than one word in isolation have also had tonal labels added. Pitch targets in these utterances were labelled following conventions of several intonational phonology models and ToBI systems (Beckman et al., 2005; Jun & Fletcher, 2014).

Table 3. Elicitation types with examples

STIMULUS TYPE	EXAMPLES		
NOUN	<i>doro</i> 'chicken'	<i>samuna</i> 'soap'	<i>arəŋg<sup>w</sup>ade</i> 'green'
NOUN + PL	<i>doro-wotʃf</i> chicken-PL 'chickens'	<i>samuna-otʃf</i> soap-PL 'soaps'	<i>arəŋg<sup>w</sup>ade-otʃf</i> green-PL 'greens'
NOUN + PL + DET	<i>doro-wotʃf-u</i> chicken-PL-DET 'the chickens'	<i>samuna-otʃf-u</i> soap-PL-DET 'the soaps'	<i>arəŋg<sup>w</sup>ade-otʃf-u</i> green-PL-DET 'the greens'
PREP + NOUN	<i>lə-igziabher</i> to-God 'to God'	<i>kə-wəmbər</i> from-chair 'from a chair'	<i>kə-təmari</i> from-student 'from a student'
NOMINALISED OR ADJECTIVISED (NOM/ADJ)	<i>məŋgadə-ɲna</i> road-NOM 'traveller'	<i>ibrit-əɲna</i> arrogance-ADJ 'arrogant'	<i>bəʃʃit-əɲna</i> sickness-ADJ 'sick'
VERBS: DISYLLABIC STEMS (PERFECTIVE)	<i>səbbər-ə</i> break-3SG.MASC.PFV 'he broke'	<i>galləb-ə</i> gallop-3SG.MASC.PFV 'he galloped'	<i>nəggər-ə</i> tell-3SG.MASC.PFV 'he told'
VERBS: DISYLLABIC STEMS (PARTICIPLE)	<i>səba.r-i</i> break-3SG.MASC.PART 'breaking(3sg.masc)'	<i>galəb-i</i> gallop-3SG.MASC.PART 'breaking(3sg.masc)'	<i>nəgar-i</i> tell-3SG.MASC.PART 'telling(3sg.masc)'
VERBS: TRISYLLABIC STEMS (PERFECTIVE)	<i>məsekkər-ə</i> testify-3SG.MASC.PFV 'he testified'	<i>deməddəm-e</i> finish-3SG.MASC.PFV 'he finished'	<i>k'əlakk'əl-ə</i> mix-3SG.MASC.PFV 'he mixed'
VERBS: TRISYLLABIC STEMS (PARTICIPLE)	<i>məskar-i</i> testify-3SG.MASC.PART 'testifying(3sg.masc)'	<i>demdam-i</i> finish-3SG.MASC.PART 'finishing(3sg.masc)'	<i>k'əlak'a-j</i> mix-3SG.MASC.PART 'mixing(3sg.masc)'
TWO-WORD SENTENCES <sup>4</sup> : 2+4 SYLLABLES	<i>hakim mərəmmər-ə</i> doctor examined-3SG.MASC 'a doctor examined'	<i>abif</i> fenugreek	<i>ləbəlləb-ə</i> scorched-3 SG.MASC 'he scorched fenugreek'

<sup>4</sup> All sentences from here onwards are in the perfective unless otherwise specified.

4+2 SYLLABLES	<i>igziabher k'əbb-a</i> God anointed-3SG.MASC 'God anointed'	<i>məngədəjɲa fənn-a</i> traveller urinated-3SG.MASC 'a traveller urinated'
THREE-WORD SENTENCES: 2+2+2 SYLLABLES	<i>Dawit billa ləkk-a</i> David knife measured-3SG.MASC 'Dawit measured a knife'	<i>hakim lomi bəll-a</i> doctor lemon ate-3SG.MASC 'a doctor ate a lemon'
2+2+3 SYLLABLES	<i>gərəd wiha garrəd-ə</i> maid water covered-3SG.MASC 'a maid covered water'	<i>wələdʒ wəmbər t'ərrəb-ə</i> parent chair carved-3SG.MASC 'a parent carved a chair'
2+3+2 SYLLABLES	<i>Dawit anbəssa ləkk-a</i> David lion measured-3SG.MASC 'Dawit measured a lion'	<i>hakim timatim bəll-a</i> doctor tomato ate-3SG.MASC 'a doctor ate a tomato'
2+3+3 SYLLABLES	<i>Dawit anbəssa gəddəl-ə</i> David lion killed-3SG.MASC 'Dawit killed a lion'	<i>kahin təmari səbbək-ə</i> pastor student preached-3SG.MASC 'a pastor preached at a student'
3+2+2 SYLLABLES	<i>indziner təbaj k'all-a</i> engineer pest decapitated-3SG.MASC 'an engineer decapitated a pest'	<i>t'əbək'a wəmbər rəss-a</i> lawyer chair forgot-3SG.MASC 'a lawyer forgot a chair'
3+2+3 SYLLABLES	<i>t'əbek'a wəmbər t'ərrəb-ə</i> lawyer chair carved-3SG.MASC 'a lawyer carved a chair'	<i>Məaza billa səbbər-ə</i> Meaza knife broke-3SG.MASC 'Meaza broke a knife'
3+3+2 SYLLABLES	<i>gəbərə timatim bəll-a</i> farmer tomato ate-3SG.MASC 'a farmer ate a tomato'	<i>nəwari indziner k'əmm-a</i> resident engineer robbed-3SG.MASC 'a resident robbed an engineer'
3+3+3 SYLLABLES	<i>Məaza anbəssa gəddəl-ə</i> Meaza lion killed-3SG.MASC 'Meaza killed a lion'	<i>nəwari indzera garrəd-ə</i> resident injera covered-3SG.MASC 'a resident covered injera'
FOUR-WORD SENTENCES: 1+3 SYNTACTIC GROUPING	<i>Abate lə-Meaza ahijja agəjɲ-a</i> Abate for-Meaza donkey obtained-3SG.MASC 'Aabte obtained a donkey for Meaza'	<i>Haile lə-Lidet wəmbər sərr-a</i> Haile for-Lidet chair made-3SG.MASC 'Haile made a chair for Lidet'

2+2 SYNTACTIC GROUPING	<p><i>jə-Abate mist ahijja agəŋŋ-etf</i>          poss-Abate wife donkey obtained-3SG.FEM          ‘Abate’s wife obtained a donkey’</p> <hr/> <p><i>jə-Dawit ihit billa gəzz-atf</i>          poss-David sister knife bought-3SG.FEM          ‘Dawit’s sister bought a knife’</p>
3+1 SYNTACTIC GROUPING	<p><i>jə-Məaza tannaŋ ihit tanəbbal-etf</i>          poss-Meaza young sister read-3SG.FEM          ‘Meaza’s young sister read’</p> <hr/> <p><i>jə-Lelila rədzdzim wəndim zəffən-ə</i>          poss-Lelila tall brother sang-3SG.FEM          ‘Lelila’s tall brother sang’</p>
CORRECTIVE FOCUS*	<p>(Meaza bought a beautiful house)  <i>aj, Meaza ask’əjami bet nəw gəzz-atf-iw</i>          no, Meaza ugly house copula bought-3SG.FEM-3SG.MASC.OBJ          ‘no, Meaza bought an <i>ugly</i> house’</p> <hr/> <p>(Aster cooked the chickens)  <i>aj, Aster fɪnbra nəw jabəssəl-atf-iw</i>          no, Aster chickpea copula cooked-3SG.FEM-3SG.MASC.OBJ          ‘no, Aster cooked <i>chickpeas</i>’</p>

\*The first sentence, in parentheses, sets the context for the second sentence.

## 4 Findings & Discussion

Following Alemayehu (and to some extent, Leslau), we are working under the assumption that Amharic shows fixed, predictable, lexical stress, demarcated by a high pitch on the stressed syllable in isolation (Ladd, 2008)—we keep in mind he proposes this becomes a low pitch accent in declarative contexts. Amharic, then, is not like languages such as Korean and Mongolian, where there is no stress, thus no pitch accent; Amharic should behave more like Bengali or Georgian, languages that do have stress which can carry pitch accent to become (prosodically) prominent (Abbas & Jun, 2022; Jun, 2005, 2014). A second assumption is that, despite disagreement between authors (seen in Section 2.2.2, detailing Armbruster’s and S&H’s claims to multiple stress), a word of Amharic carries only one stress; corroboration for this assumption may be seen below in Section 4.1.

Based on the assumptions this paper works under, mentioned above, Amharic has lexical stress. As such, according to the typology of word prominence marking (Jun, 2005, 2014), Amharic is expected to belong to head-prominence languages, which mark word prominence with pitch accents on stressed ‘head’ syllables. The degree to which this holds true is investigated in Sections 4.2–4.4. Based on the fact that in Amharic lexical stress does not participate in forming the intonation contour in declarative sentences (see Section 4.1), a model of intonational phonology for Amharic declarative sentences is introduced in the Autosegmental-Metrical (AM) framework (Beckman & Pierrehumbert, 1986; Ladd, 2008; Pierrehumbert, 1980). The tonal patterns of the Amharic Accentual Phrase (AP) are described

Section 4.3. Any and all intonation data and analysis presented in this paper should be considered to be very preliminary, purely based on F0 observations and a small dataset. The data are from only one speaker with a limited dataset, and further research is required.

All examples included from here onwards will be shown as a spectrogram of the relevant word or phrase. The pitch range for pitch tracks in general is that of 75Hz – 350Hz. Any deviations from this standard pitch range will be noted in the description of each respective figure as ‘pitch range’ (p.r.), followed by the range. For example, a pitch range of 50Hz – 150Hz will be indicated by ‘p.r.: 50-150Hz’.

The term ‘initial high’ will be used throughout the presentation and discussion of the Amharic AP and requires some explication. This term should not be interpreted to literally mean a high tone on the initial syllable. Within a given tonal pattern, such as LHLH, ‘initial high’ is referring to the first (i.e., initial) high tone in the pattern, which normally surfaces on the second syllable of an AP, with the first low tone being the ‘initial’ tone in that it is actually found on the first syllable (Jun, 1998).

Differentiation between phonological and phonetic dephrasing is important for the discussion of corrective focus data in Section 4.4. On one hand, there is phonological dephrasing, which happens when AP boundaries after a focussed word are deleted, resulting in one long AP. On the other hand, phonetic dephrasing can be defined as post-focal items retaining their accentual phrasing, but with a reduced pitch range and amplitude (Jun, 2011; 2019).

## 4.1 Word Stress

### 4.1.1 Position of Stress Within Stems

While word stress in Amharic is not phonemic (i.e., there are no *monomorphemic* minimal pairs), there are nonetheless distinctions, albeit morphologically predictable; Amharic has predictable lexical stress. The basic pattern, which will be illustrated below, assigns stress to the penultimate syllable of verbal stems, and as close as possible to the antepenultimate syllable from the right edge of a non-verbal stem. When a word is produced in isolation, one syllable is realised in high F<sub>0</sub>, and the location of this syllable is predictable based on its morphological identity. High intensity and longer duration are not consistent features of a stressed syllable in Amharic. This follows the well-known general pattern of low vowels being longer and louder than high vowels, making intensity and duration less consistent cues.

Although only one minimal pair has been found in the data, it is possible to use morphology to construct sets of words that have the same number of syllables, but with different morphological compositions. A couple of these sets of words will be introduced below to demonstrate how they show the predictions from the stress pattern introduced above. In the first set of words, all related to each other. There are two non-verbal words, (1)

and (2), ‘rain’ and ‘rainy,’ and two verbal words<sup>5</sup> (3) and (4), ‘rain-3SG.NEUT.PFV’ and ‘rain-3SG.NEUT.PART.’ The two verbal words have additional morphology, namely the /-ə/ and /-ama/ suffixes. The nominal and adjectival forms are both monomorphemic, even though the adjectival has the same shape as the participle.

(1) <i>zɨ.nab</i>	(3) <i>zán.nə.b-ə</i>
rain	rain-3SG.NEUT.PFV
‘rain’	‘it rained’
(2) <i>zɨ.ná.ba.ma</i>	(4) <i>zɨ.na.b-a.ma</i>
rainy	rain-3SG.NEUT.PART
‘rainy’	‘raining’

The description of stress presented above predicts that the penultimate syllable of the stems of (1), (3) – (4) ought to be stressed, while the antepenultimate syllable of (2) will carry stress. These have all been marked on their respective syllables with an acute accent. In (1) we expect penultimate stress since it is a disyllabic non-verbal word, and penultimate stress is as close as possible to the posited antepenultimate stress for this type of word. Below we see the pitch tracks for each of these words, showing how stress does fall on the predicted syllable.

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<sup>5</sup> Further investigation in this area should look at imperative forms of Amharic verbs as well, as this form is the only one in the entire Amharic verbal paradigm that is purely a stem. The 3sg.masc perfective forms were used initially as these are considered the citation forms of the Amharic verb. Additionally, more trisyllabic roots in the participle should be examined as one verb type loses a syllable when the participle is formed, and the other does not. The verbs used for this study all coincidentally belong to the type that loses a syllable, yielding only disyllabic stems in the participle. Based on the pattern discussed, even trisyllabic participle stems are expected to have penultimate stress.

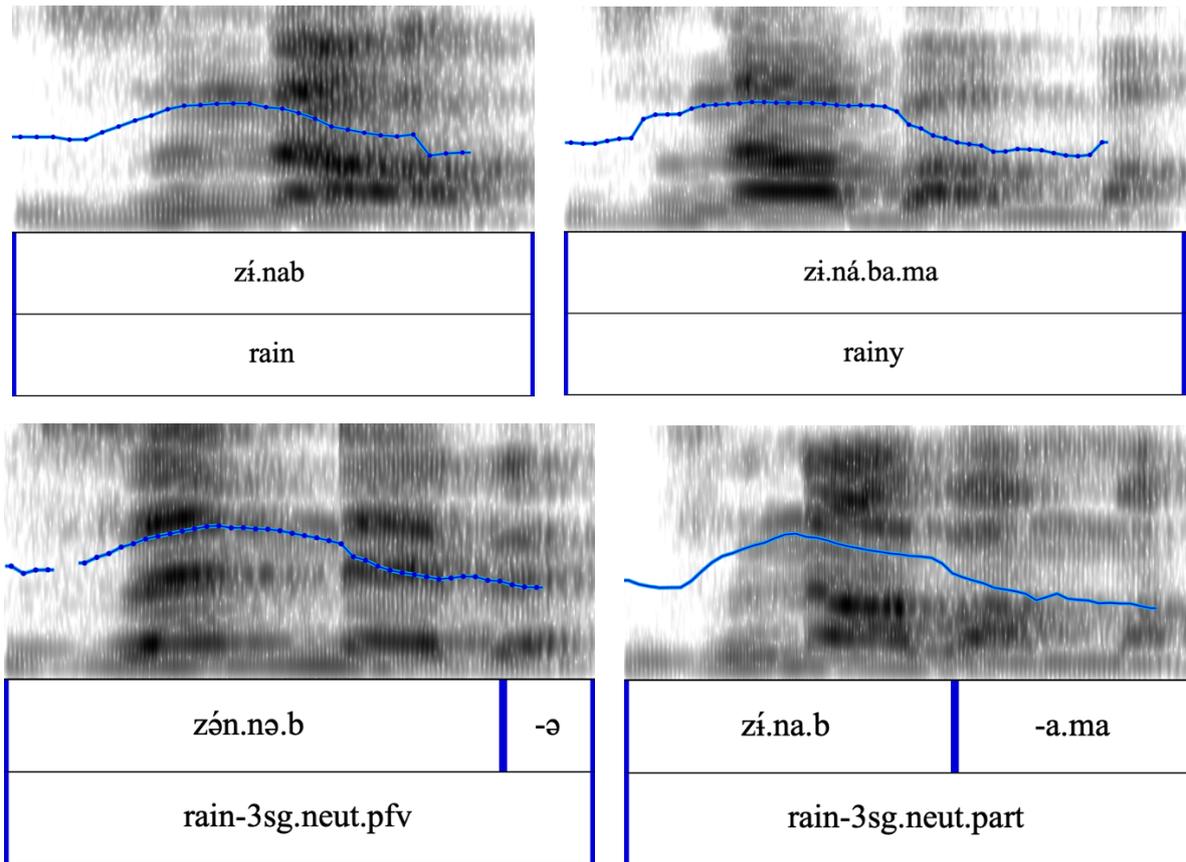


Figure 7. Spectrograms for /zɪnab/ 'rain,' /zɪnabama/ 'rainy,' /zɛnnəbə/ 'it rained,' and /zɪnabama/ 'raining,'.

The second set of words consists of a noun, an adjective, and a verb, shown in (5) – (7), all four syllables long. The noun and adjective have the plural suffix /-otʃtʃ/, while the verb has the 3SG.MASC.PFV suffix /-ə/.

- |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| (5) <i>tá.ma.ri.-otʃtʃ</i> | (6) <i>tá.ta.ri.-otʃtʃ</i> | (7) <i>la.k'ál.lə.k'-ə</i> |
| student-PL                 | industrious-PL             | smear-3SG.MASC.PFV         |
| 'students'                 | 'industrious'              | 'he smeared'               |

For both (5) and (6) our predictions place stress on the antepenultimate syllable of the stem, while for (7) we expect to see stress on the penultimate stem syllable.

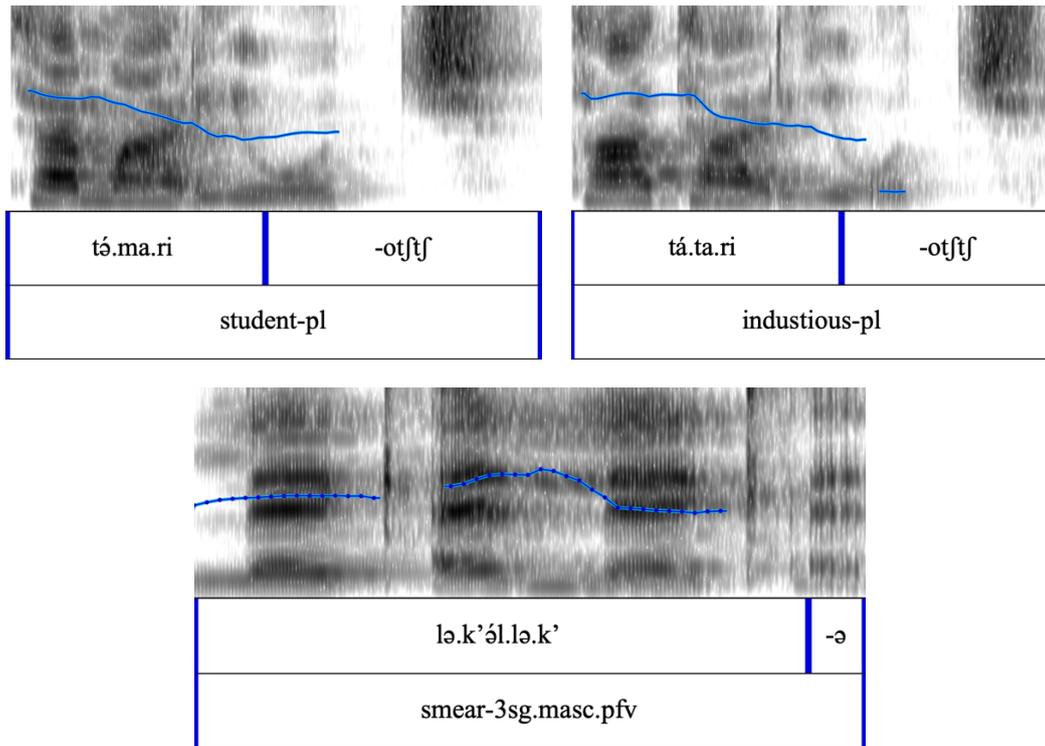


Figure 8. Spectrogram for /təmariotʃʃ/ 'students,' /tatariotʃʃ/ 'industrious-PL,' and /lək'əllək'ə/ 'he smeared'.

#### 4.1.2 Effects of Affixation on Stress

In some languages, affixes play a factor in determining how stress is distributed. To show the role these play in Amharic stress, we examine Figures 9 – 11. Verbs have high pitch on the penultimate syllable of their respective stems. Figures 9 – 10 show that suffixation has no effect on the position of stress. Further, Figure 11 demonstrates that the type and degree of affixation also have no effect on stress. Thus, it is safe to conclude that affixes do not interfere with the assignment of stress in Amharic verbal forms.

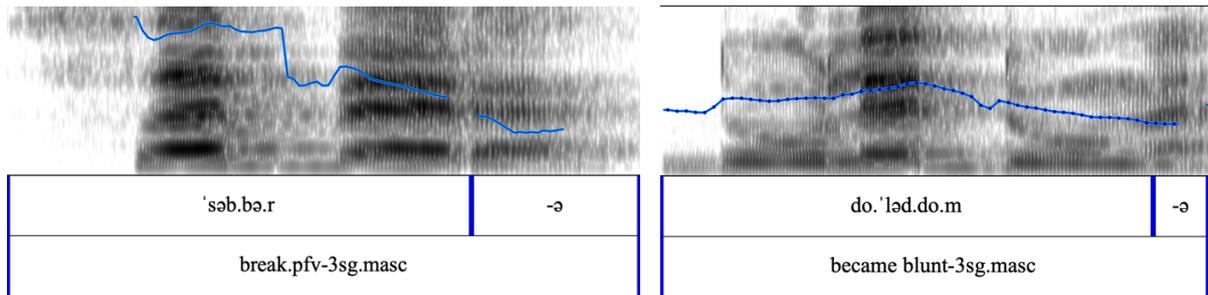


Figure 9. Spectrograms for /səbbəɾə/ 'he broke' (p.r.: 75-300Hz) and /doləddomə/ 'he/it became blunt' (p.r.: 50-250Hz).

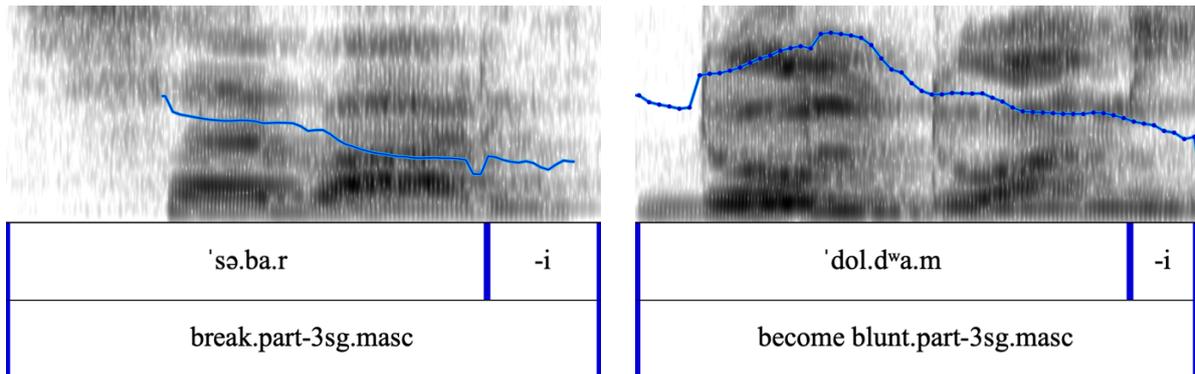


Figure 10. Spectrograms for /səbari/ 'breaking(3sg.masc)' (p.r.: 100-300Hz) and /doldʷami/ 'becoming blunt(3sg.masc)' (p.r.: 50-250hz).

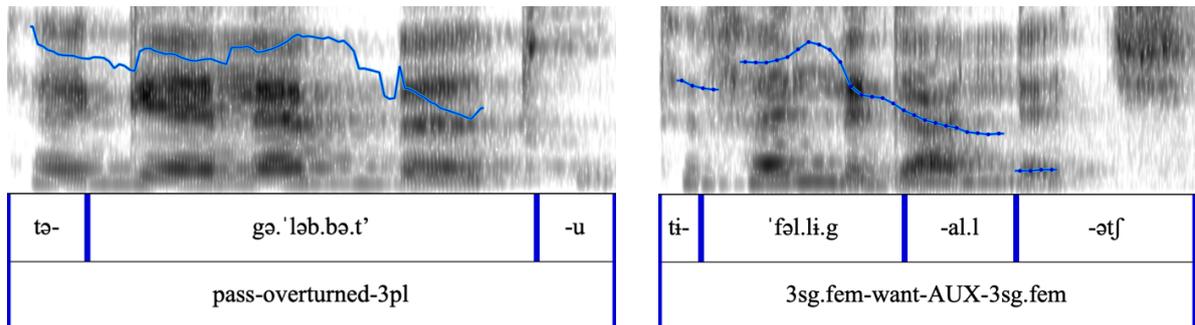


Figure 11. Spectrograms for /təgələbbət'u/ 'they were overturned' (p.r.: 100-250Hz) and /tifəlligallətʃ/ 'she will want' (p.r.: 35-350Hz).

Non-verbal stems have stress on the antepenultimate syllable, or as close as possible to the third syllable from the right edge of a stem (allowing disyllabic words to still fall under an antepenultimate system without complications) (Figures 12 – 14).

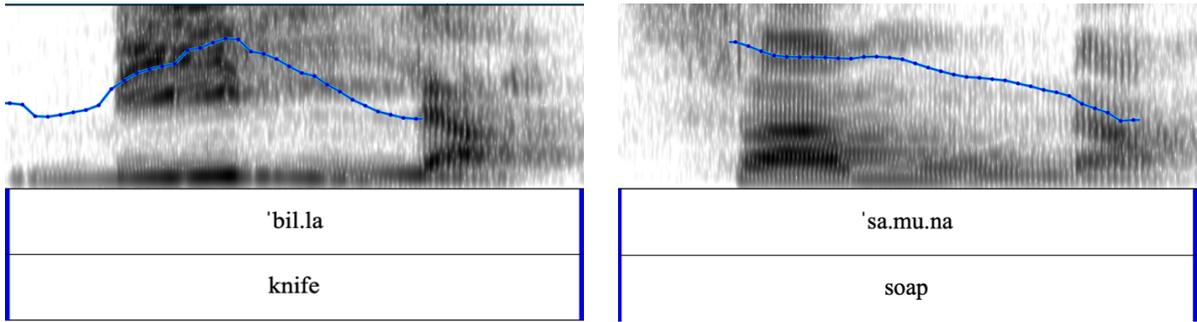


Figure 12. Spectrogram for /billa/ 'knife'. & Figure 13. Spectrogram for /samuna/ 'soap' (p.r.: 50-250Hz for both).

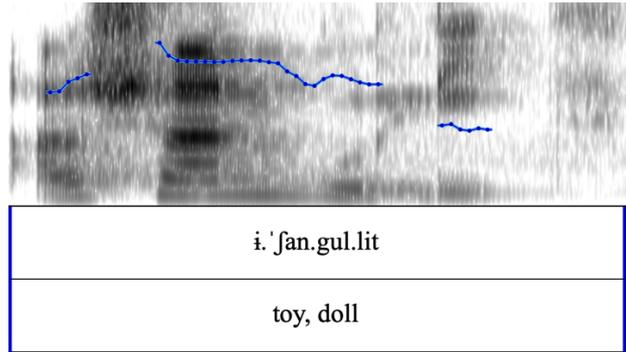


Figure 14. Spectrogram for 'toy, doll' /i.'jan.gul.lit/ (p.r.: 50-275Hz).

As with verbal forms, affixation has no influence on the position of stress in non-verbal stems. Figure 15 contains an example of a word with a prepositional prefix. Although this is not expected to have an effect on stress location as stress is assigned based on the right edge of a stem, it has been included for transparency. For comparison, the second spectrogram in Figure 15 shows the nominal form without a prepositional prefix.

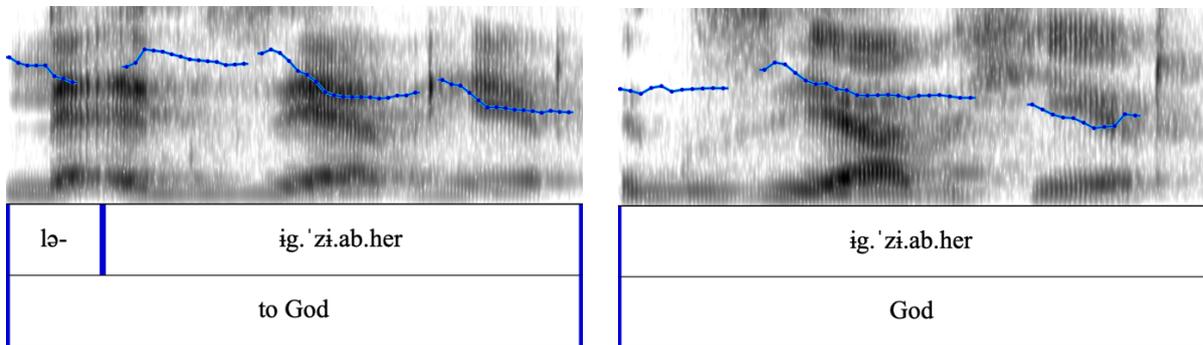


Figure 15. Spectrograms for /ləigziabher/ 'to God' and /igziabher/ 'God' (p.r.: 75-250Hz for both).

Figure 16 shows a similar pattern. The addition of two suffixes—and two syllables—to a bare-stemmed non-verb does not shift stress along the stem to be postlexically antepenultimate.

Rather, we see that the antepenultimate syllable of the stem still carries high pitch, same as with the pure nominal form (second spectrogram in Figure 16 for comparison).

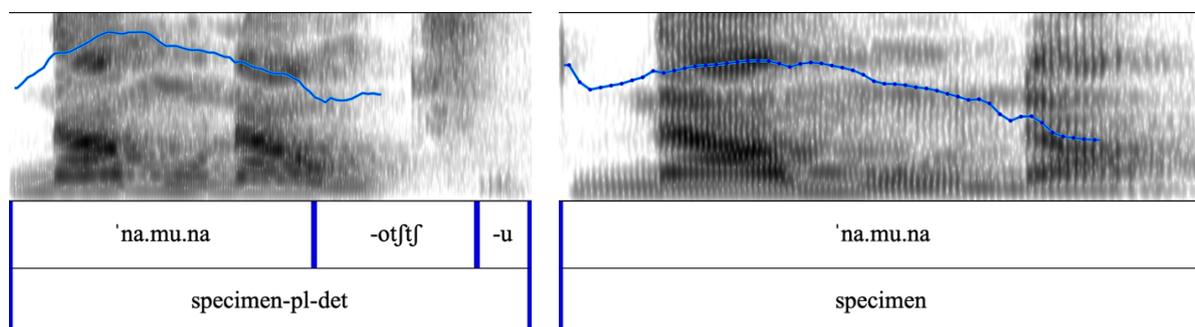


Figure 16. Spectrograms for /namunaotʃtʃu/ 'the specimens' and /namuna/ 'specimen' (p.r.: 75-250Hz for both).

A caveat to identifying this stress system was that it is only visible in words in isolation.

Figure 17 shows a spectrogram for the sentence 'Meaza broke a knife', thus containing the same word as in Figure 12 ('knife'). Figure 17 shows that the F0 peak on the word 'knife' is not on the word-initial syllable as in Figure 12, but on the final syllable. Similarly, if we compare the F0 pattern of the word 'soap' in Figure 13 and Figure 18, and the word 'God' in Figure 15 and Figure 19, we see that the F0 peak is on the antepenultimate syllable of the word in Figures 13 and 15, but on the final syllable of the same word in Figures 18 and 19, respectively.

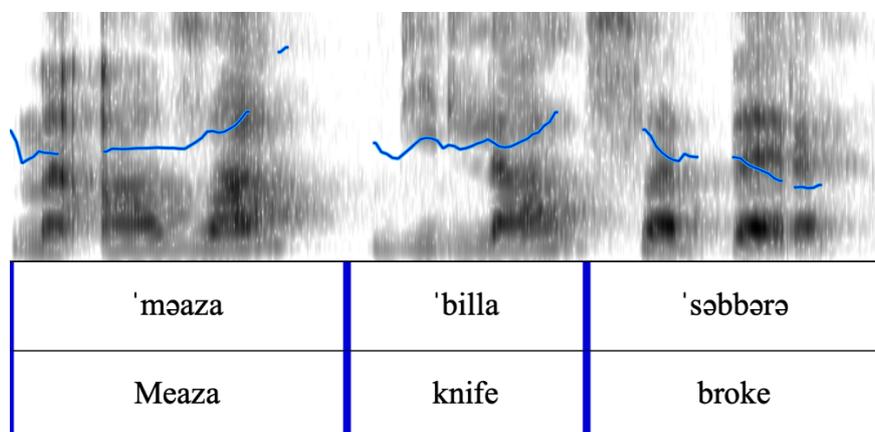


Figure 17. Spectrogram of /mæaza billa səbbərə/ 'Meaza broke a knife' (p.r.: 75-275Hz). Compare the F0 pattern on [billa] 'knife' with the same word in Figure 12.

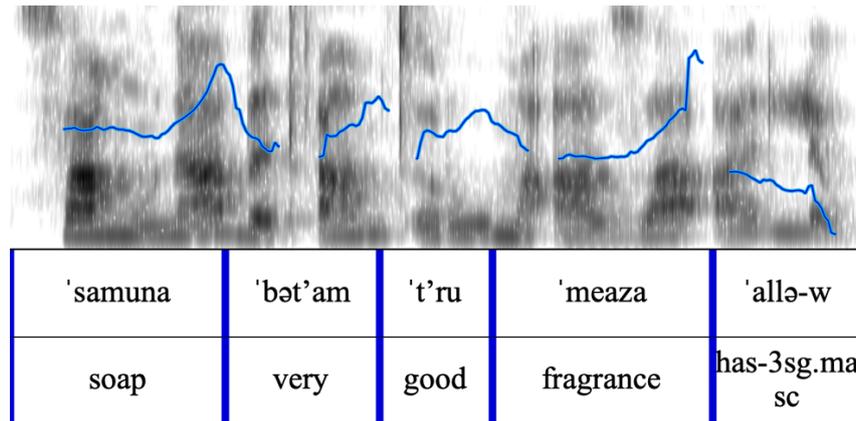


Figure 18. Spectrogram of /samuna bət'am t'ru məaza aləw/ 'soap has a very nice fragrance' (p.r.: 80-350Hz). Compare the F0 pattern on [samuna] 'soap' with the same word in Figure 13.

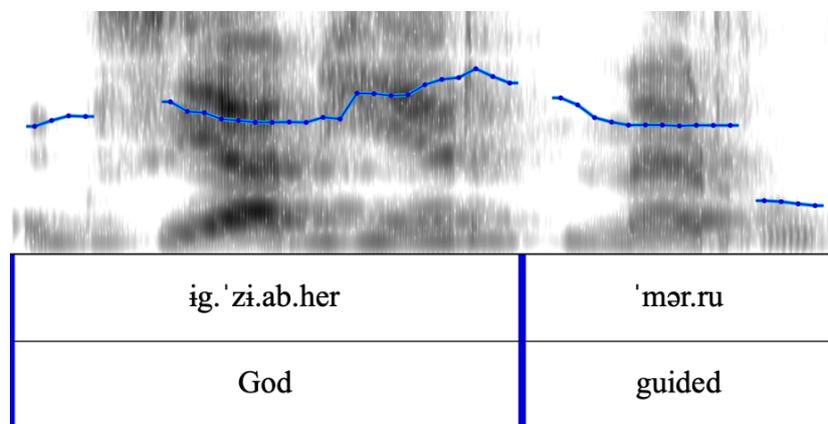


Figure 19. Spectrogram of /igziabher mərru/ 'God guided' (p.r.: 25-300Hz). Compare the F0 pattern on [igziabher] 'God' with the same word in Figure 15.

Note that in Figure 19 the second syllable of the word 'God' seems to have a peak on the stressed /zi/, as in isolation, plus another H at the end of the word. The initial peak should not be confused with a H\* pitch accent; it is part of the underlying tonal representation that is surfacing (see Section 4.3 for details on the underlying tonal pattern).

#### 4.1.3 Stress Beyond Words in Isolation

In phrases, even as small as two words, there is no predictable pitch contour on the same syllable that receives a high F0 in isolation, suggesting that lexical stress is not involved in forming phrase-level intonation (see Section 4.2 for a more detailed discussion): we

instead see high tones at the end of non-phrase-final words on a declarative sentence pitch track (Figures 17 – 22).

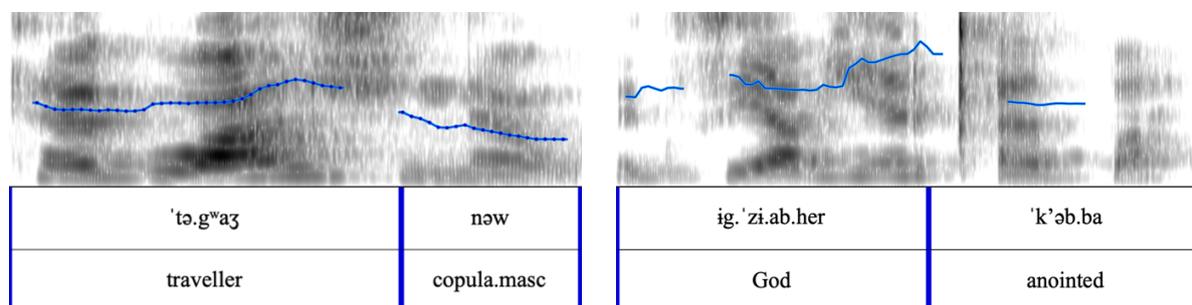


Figure 20. Spectrogram for /təgʷaɜ nəw/ 'he is a traveller' & Figure 21. /igziabher k'əbba/ 'God anointed'.

In the words tier of each figure, a syllable that carries high pitch in isolation has been marked as stressed. This facilitates identification of the stressed syllable to compare with Alemayehu's (1987) account of high pitch in isolation becoming a low pitch in declarative sentence contexts.

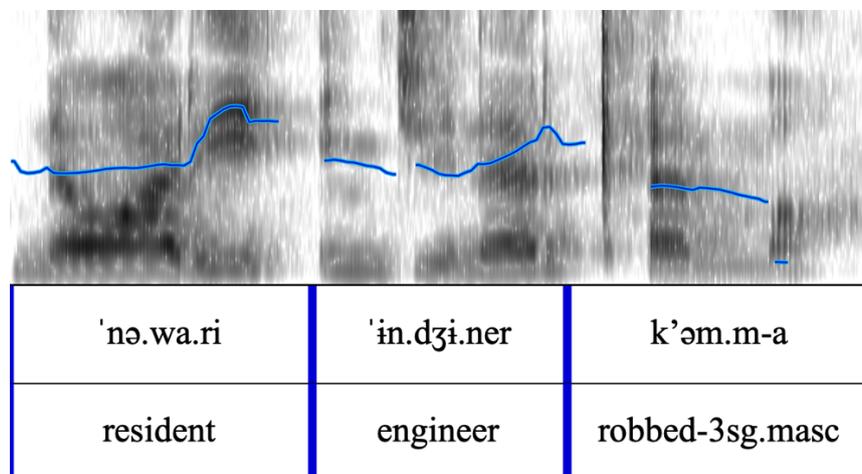


Figure 22. Spectrogram for /nəwari indʒiner k'əmma/ 'a resident robbed an engineer' (p.r.: 50-350Hz).

We can note in Figures 20 – 22 that there is no indication of a pitch accent on any of the words in this sentence, whether high—as in isolation, or low—as in Alemayehu's declarative sentences. If we were to see a low pitch accent on the stressed syllable, as per Alemayehu, we would expect to see a distinctly low F0 minimum on that syllable. Rather, what we

generally see as ‘low pitch’ is consistently low for the duration of a word until the sharp rise on the final syllable—with the exception of ‘God’ showing a slight high on its second syllable.

## 4.2 Stress in Phrasal Context

As we saw earlier in Figures 17 – 22, in phrasal context there appears to be no predictable pitch contour that could indicate or correspond to the stressed ‘head’ syllable (Jun, 2005, 2014), suggesting that lexical stress in Amharic does not participate in forming phrasal intonation. One could argue that the dialect of my speaker is in the process of losing the status of stress based on the declarative intonation data gathered. That is, even though stress seems to show its trace when a word is produced in isolation, stress shows no F0 trace and is not involved in forming the intonation of a phrase or multi-word sentence; in phrasal contexts, the stressed syllable shows no consistent F0 peak or valley thus far. This suggests that word prominence at a sentence level is not cued by a pitch accent—the tone on the lexical head, but by ‘edge’ tones—a low tone on the word-initial syllable and a high tone on a word-final syllable—with a word constituting the domain of a rising tone (Jun, 2005, 2014).

Another argument for the suppression of stress in phrasal context lies with the intensity of certain vowels. If the vowel of the syllable that is stressed in isolation were to show a higher intensity than other vowels of the same word in phrasal context, an argument could be made for the presence of stress in this context. However, the intensity of phrase-final vowels suggests otherwise. We can note that the second word in Figures 23 – 24 has

lexical stress on the initial syllable but the final syllable shows stronger intensity—represented by a darker grey colour on the spectrogram—in both words. The waveform has also been included for comparison between vowels. This stronger intensity on the word-final syllable is not due to the inherent vowel quality because the final vowel in Figure 23 is the same vowel as the first syllable. The spectrogram and waveform of ‘chair’ are included for comparison. These show that the first schwa in ‘chair’ is higher in intensity than the second one when produced in isolation, further supporting the claim that there is higher phrase-final intensity in Amharic.

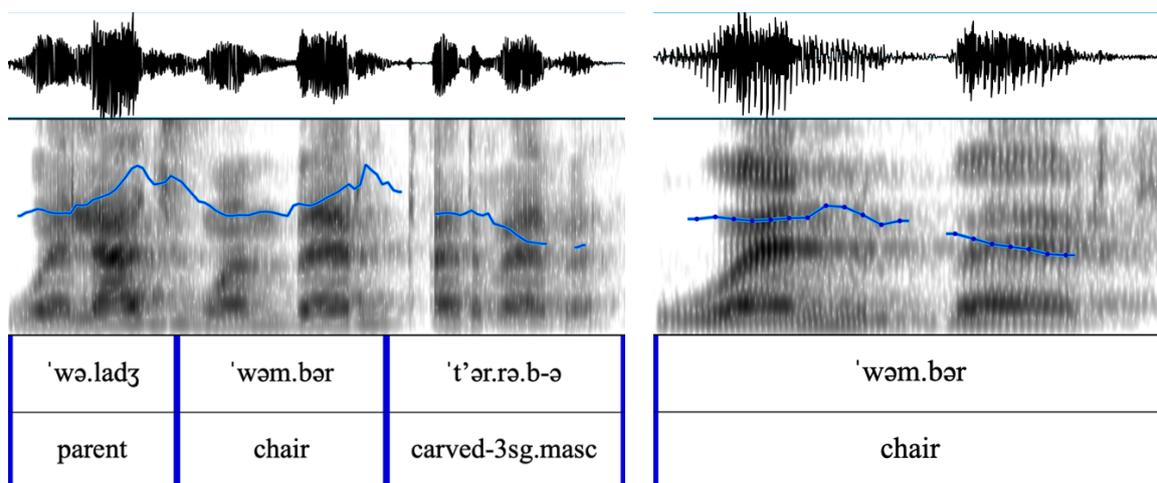


Figure 23. Spectrograms for /wələdʒ wəmbər t'ərrəbə/ 'a parent carved a chair (out of wood)' and for /wəmbər/ 'chair' (p.r.: 50-275 for both).

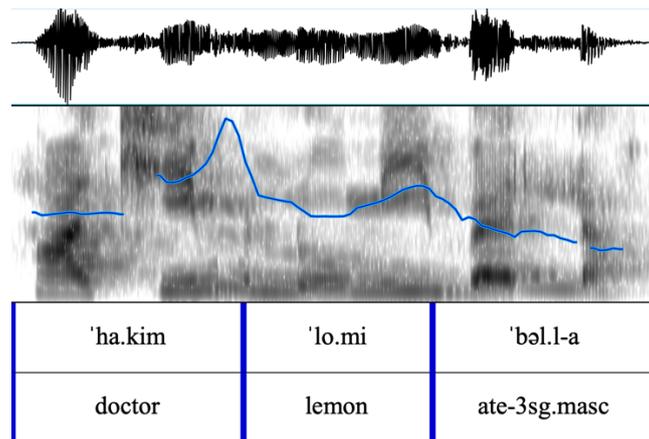


Figure 24. Spectrogram for /hakim lomi bælla/ 'a doctor ate a lemon' (p.r.: 50-350).

In Figure 24 the final vowel is [i], a high vowel, while the first syllable has an [o], a mid vowel, which should have stronger intensity than a high vowel, everything else being equal. However, the intensity of /o/ and /i/ look very similar, which indicates that there is higher intensity phrase finally. Were the intensity of phrase-final vowels not higher, we would expect to /o/ to have higher intensity than /i/.

With this in mind, the importance of the examples in Figures 17 – 24 becomes clearer: we see the high tone on the word-final syllable, i.e., a boundary tone, regardless of syllable length of the first word. This is indicative of the boundary tones manifesting in more than just specific contexts, and shows that the same boundary tones are present despite the difference in syllable count of each word, reinforcing the domain of the rising tone as a word. However, looking at the sentence in Figure 25, we see that the domain of rising is not just one word. Rising occurs twice, each time over the span of two words. Similarly, the sentence in Figure 26 shows the rising tone to occur over three words, indicating that the domain of rising is not limited to just one or two lexical items.

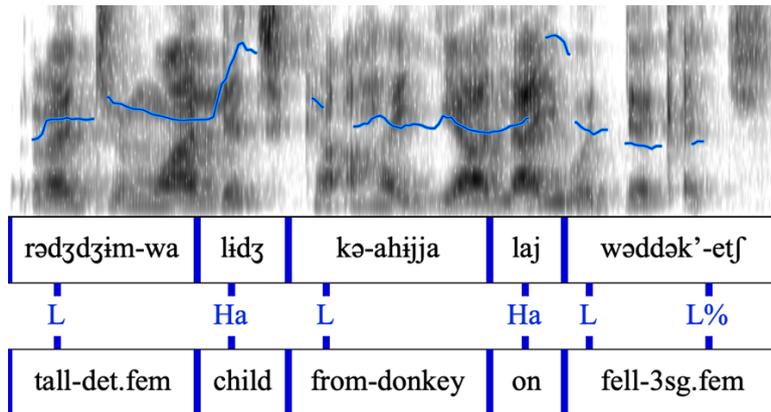


Figure 25. Spectrogram for /rədʒdʒimwa lidʒ kəahijja laj wəddək'ətʃ/ 'the tall girl fell off (from on) a donkey' (p.r.: 50-350Hz) with preliminary tonal labels.

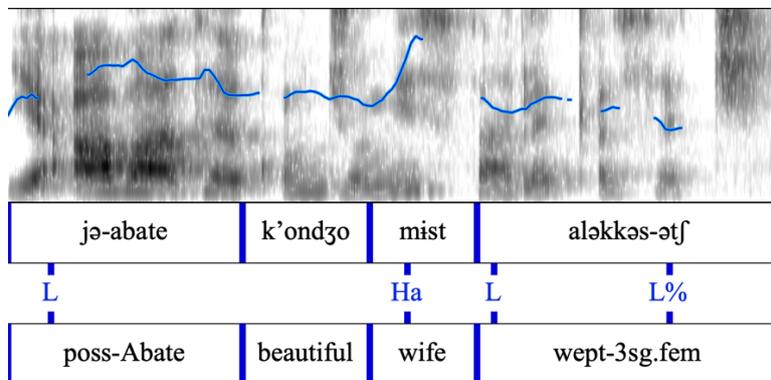


Figure 26. Spectrogram for /jəabate k'ondʒo mist aləkkəsətʃ/ 'Abate's beautiful wife wept' (p.r.: 50-350Hz) with preliminary tonal labels.

The domain of rising is larger than one word; thus an Accentual Phrase (AP). Further investigation into the length of the Amharic AP may be found in Section 4.3.2. As such, the preliminary tonal labels for indicating word prominence at a sentence level could be described as [L Ha]—with Ha being the High boundary tone marking the end of an AP.

### 4.3 Amharic Levels of Phrasing

The levels of phrasing posited here are the Accentual Phrase (AP), and Intonational Phrase (IP). These phrases are tentatively tonally marked as follows in a declarative sentence context:

(8) Accentual Phrase: [L Ha]

(9) Intonational Phrase: [ L%]

The Amharic AP is similar to APs of Korean (Jun, 1998), Tokyo Japanese (Pierrehumbert & Beckman, 1988), and French (Jun & Fougeron 1995; Fougeron & Jun, 1998) in that it is also a unit that may contain more than one lexical item (see Section 4.3.1), and is demarcated by a tonal pattern (Jun, 1998), which for Amharic is shown in (8). Like the French and Korean APs, and unlike the Japanese AP, the Amharic AP seems only have boundary tones that are independent of the lexical items within. As in other models under the AM framework, the IP is a prosodic level above an AP; its final boundary tone, L%, overrides that of the AP, Ha, in declarative contexts.

#### 4.3.1 Amharic Accentual Phrase

The underlying tonal pattern of the Amharic Accentual Phrase is shown in (10):

(10) Underlying Accentual Phrase: [L H L Ha]

This underlying Low-High-Low-High is as in Seoul Korean and French (Jun, 1998; Jun & Fougeron, 2000, 2001), and may be represented as [L H L Ha]—this can be realised as

[L L Ha] or [L Ha] in some contexts, as discussed below. That is, the initial High, i.e., the second tone, is optional. The first and second tones are associated with the first and second syllables of an AP, while the penultimate and final tones are associated with the penultimate and final syllables of the AP. Here we also work under the assumption that the initial high—i.e., the first high in a LHLH sequence, not a high on the initial syllable—is *loosely* associated with the second syllable (Jun, 1993, 1998). Similarly, the second low target is associated with the penultimate syllable of the AP. A final note on the tonal pattern of an AP is on the interaction between an AP-final tone and an IP-final tone. As mentioned, the final tone of the latter overrides that of the former, resulting in every final AP in declarative phrases showing a L tone rather than a H tone, as L% overrides Ha. Given this underlying tonal pattern, the tonal targets of the sentences in Figures 25 – 26 are reanalysed to those seen below in Figures 27 – 28.

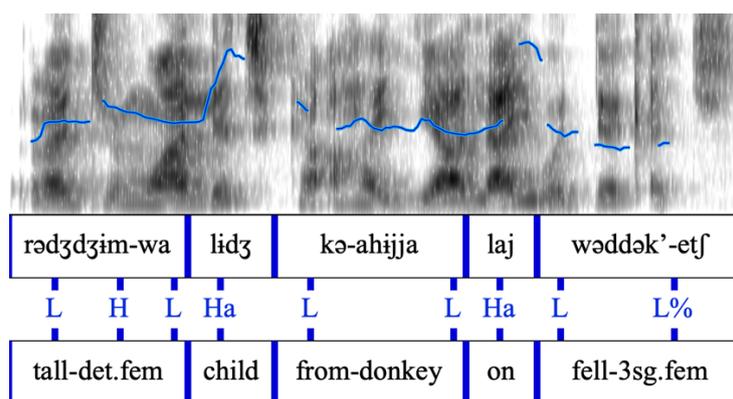


Figure 27. Spectrogram for /rədʒdʒimwa lidʒ kəahijja laj wəddək'ətʃ/ 'the tall girl fell off (from on) a donkey' (p.r.: 50-350Hz).

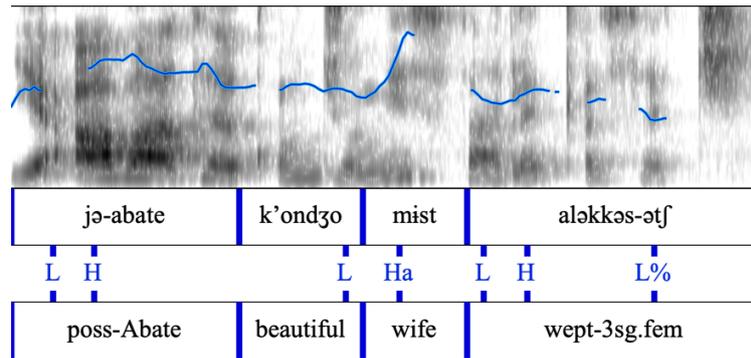


Figure 28. Spectrogram for /jəabate k'ondzo mist aləkkəsətʃ/ 'Abate's beautiful wife wept' (p.r.: 50-300Hz).

Unlike Seoul Korean, which requires at least four syllables in an AP to see the entire phrasal pattern, Amharic seems to allow all four tones to surface on shorter APs, by lengthening the AP-final syllable (refer to Section 4.3.2 for details). In APs as short as 3 syllables the LHLH pattern can be identified even though the first high and the second low tones have very slight contours in most cases (Figures 29 – 30). In all APs, including these short ones, tones that are not the boundary tones, initial L and final Ha, appear to be optional (see Figure 31), and are only found in some APs. In APs that do not show the entire underlying LHLH tonal pattern, this pattern is simplified to a LH pattern, represented as [L Ha]<sup>6</sup>, as in two-syllable words like 'Dawit' in Figure 32.

In some cases there is a lack of a clear F0 peak for initial high. Contrasting the first AP of Figures 29 – 30, both containing three syllables, illustrates this. In 'Lelila,' in Figure 29, the first high tone is reached on the second syllable of the AP, with the second low tone, visible as a slight drop from the previous syllable, spanning the very beginning of the final vowel before rising sharply to the AP-final high tone, Ha.

<sup>6</sup> The tonal pattern in (11) is shown as [L Ha] because it is the tonal pattern that most commonly surfaces on a declarative AP regardless of length, whereas the underlying [L H L Ha] does not always surface.

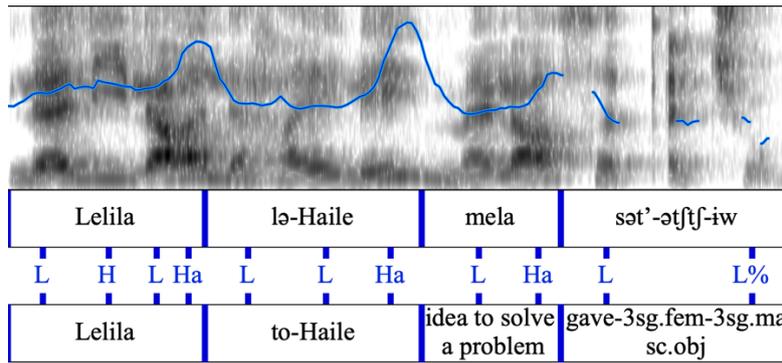


Figure 29. Spectrogram for /lelila lahaile mela sat'atftj-iw/ 'Lelila gave Haile an idea to solve a problem' (p.r.: 50-350Hz).

The example as shown by 'the city' in Figure 30 is perhaps clearer, it shows how the LHLH pattern has been compressed into a the three syllable AP: the first high tone is reached on the second syllable, showing slightly higher pitch than the first syllable; the second low tone targets the initial portion of the final syllable before rising to the AP-final tone. Thus, where Korean would usually suppress the underlying tonal pattern due to the lack of space<sup>7</sup>, Amharic is able to compress the underlying tonal pattern into smaller APs.

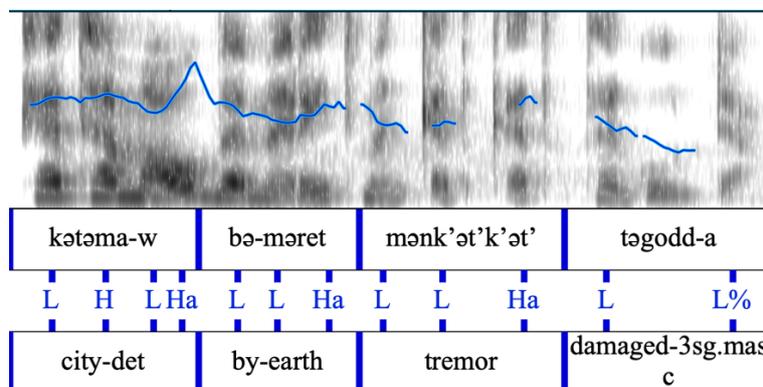


Figure 30. Spectrogram for /katamaw bamaret mank'at'k'at' tegodda/ 'the city was damaged by the earthquake'.

The optionality of the entire underlying tonal pattern surfacing can be seen in Figures 27, 29 – 30 above, and in Figures 31 – 32, below. The APs below also consist of di- and

<sup>7</sup> Korean sometimes shows a small F0 peak for the initial high as well.

trisyllabic words, ‘Dawit’ and ‘soap,’ and show a rather flat pitch contour, from the initial low up until the final rise.

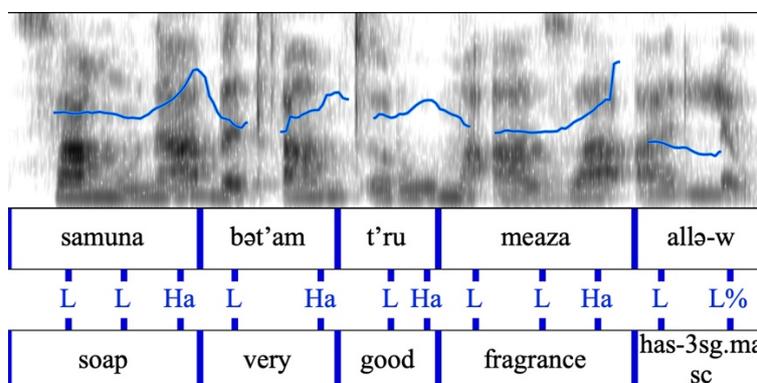


Figure 31. Spectrogram for /samuna bət'am t'ru məaza alləw/ 'soap is very fragrant' (p.r.: 55-375Hz).

However, looking at the second AP in Figure 32, ‘for Lelila’, we see a four syllable AP with a much clearer underlying tonal pattern. With enough syllables, we see how the first syllable carries a low tone and the second a high tone. If we compare the LHLH pattern of ‘for Lelila’ with the LHLH of ‘Lelila’ in Figure 29, we can see that the tone-text alignment is not predictable purely based on the number of syllables. In ‘Lelila’, the initial H is on the second syllable of the word, but in ‘for Lelila’, the initial H is on the first syllable of the word, suggesting the tone is aligned to a syllable from left-to-right in a one-by-one mapping fashion. That is, the tone of a syllable is not reflecting whether the syllable is stressed or not. This means the proposal of assuming L\* on the stressed syllable should be rejected.

Towards the end of the AP, we again see the LH AP-final pattern we would expect when the underlying tonal pattern surfaces. This sentence also shows that potentially any AP, regardless of their position within an IP, can manifest the underlying tonal pattern.

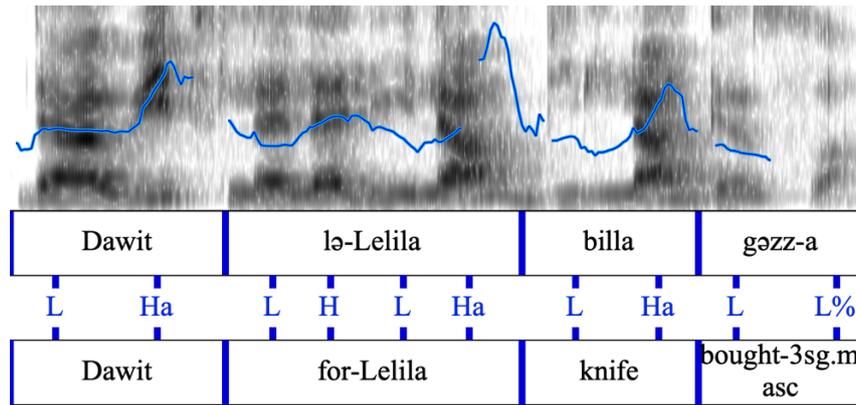


Figure 32. Spectrogram for /dawit lælilila billa gəzza/ 'Dawit bought a knife for Lelila'.

To further examine this claim, we turn to sentence-final APs with verbs longer than three syllables and find that any AP, in any position, may show the underlying tonal pattern. In Figures 33 – 34, we have two four-syllable verbs, each an AP, in IP-final position, with the underlying AP tonal pattern visible, except for the AP-final tone. As IP-final phrases, the right-edge tone is low, L%. One must also note that the initial low of the verb's AP is considered low *relative* to the previous low tone. This means we compare the AP-initial low for the verb with the low from the previous AP. In Figure 33 we see that the low, flat portion of the AP /bəbet wist/ is about the same frequency as the low pitch at the beginning of the final AP. Similarly, in Figure 34, the low pitch on /ihit/ corresponds to the low pitch on the first syllable of the verb.

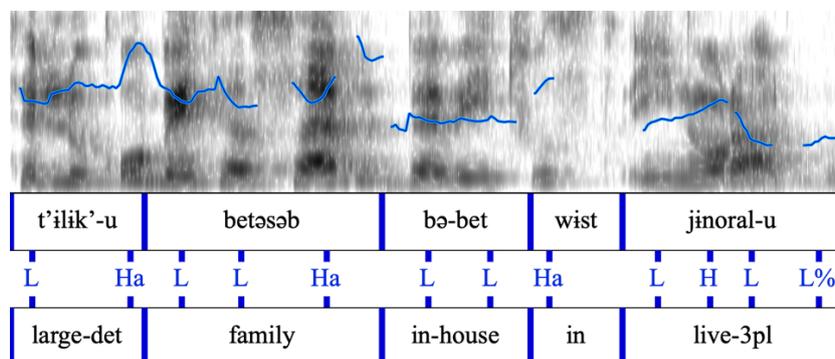


Figure 33. Spectrogram for /t'ilik'u betəsəb bəbet wist jinoralu/ 'the large family lives in the house'.

In Figure 33 there is a large rise in pitch from the first syllable to the second syllable of the verb. Looking only at the vowel portions of the spectrogram (to discount any pitch perturbations from consonants), we see how the first vowel carries a low pitch. The second vowel has a distinctly high pitch, almost level with the AP final Ha from the preceding AP. Immediately after the second syllable, on the third vowel there is a sharp drop in pitch that continues to the end of the word to accommodate for IP-final lowering to L%. Thus, the underlying tonal pattern for an IP-final AP of at least four syllables may be represented as [L H L L%].

Figure 34 shows further evidence of this. In /tanəbbalətʃ/ we again begin with pitch on the first vowel that is *lower* than that of the second vowel, resulting in a clear rise before falling on the third and last syllables.

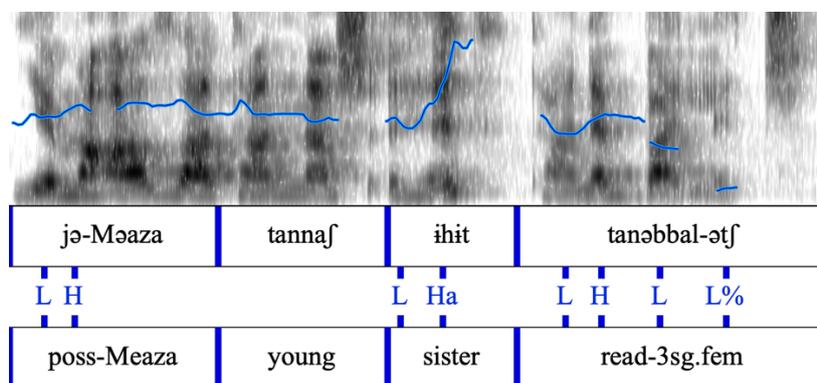


Figure 34. Spectrogram for /jəməaza tannaʃ ihit tanəbbalətʃ/ ‘Meaza’s young sister read’ (p.r.: 50-350Hz).

Figure 35 shows a proposed prosodic hierarchy of Amharic declarative utterances. This model is preliminary as it is only based on the data examined here. Further investigation may show that perhaps Amharic also has the Intermediate Phrase as a level in its prosodic hierarchy. The hierarchy shown below includes the levels that have been mentioned thus

far, the AP and the IP. The tree shows that an IP can contain more than one AP, and is marked by a boundary tone (T%) on its right edge. For a simple declarative context, this boundary tone is L%. An AP can have more than one word (w) within, the left edge is marked by a L boundary tone, and the right edge by a H boundary tone. The diagram also shows that the initial and final boundary tones align to the initial and final syllables, referred to as (s). There is no distinction between stressed (S) and unstressed (s) syllables in the hierarchy because stress is not relevant to the tone-syllable association.

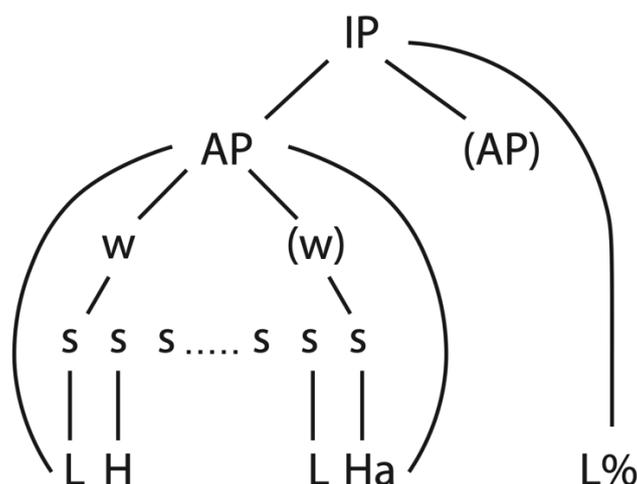


Figure 35. Intonation-based prosodic structure and tonal markings of Amharic declarative utterances.

#### 4.3.2 Accentual Phrase Length & Underlying Tonal Pattern

Following Jun's (2003) proposal that a Korean AP is limited to seven syllables, APs of varying syllable length were examined for two reasons: (i) to determine if the Amharic AP has a syllable limit, and if it does, what happens to the AP when the limit is exceeded<sup>8</sup>; (ii) to

<sup>8</sup> In Korean, APs that are too long are partitioned into smaller ones (Jun, 2003).

investigate the degree of optionality of the underlying tonal pattern appearing in APs longer than four syllables.

Based on the data collected, Amharic seems to allow at least eight syllables in an AP, perhaps even more. Two representative examples of sentences with eight-syllable APs are seen above, in Figure 34, and below, in Figure 36. Comparing the first AP of these two sentences, /jəmæaza tannaʃ ihit/ and /jələlila tannaʃ wəndim/, we see that in the former the underlying tonal pattern has not quite surfaced, while in latter it has.

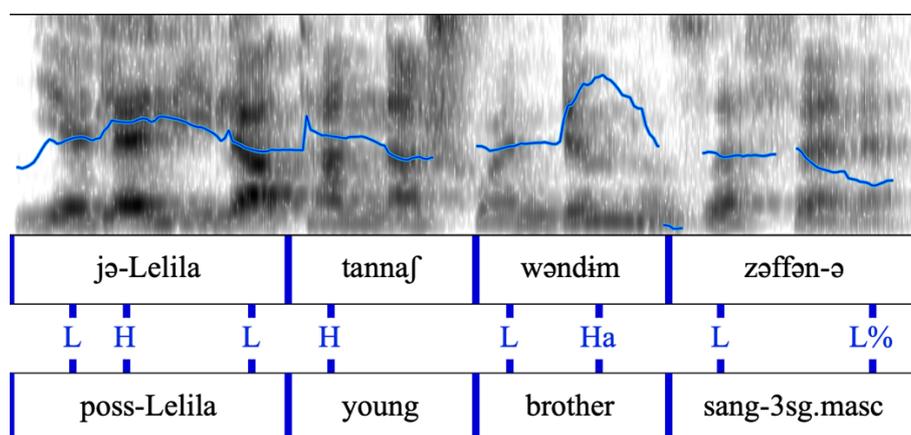


Figure 36. Spectrogram for /jələlila tannaʃ wəndim zəffənə/ ‘Lelila’s young brother sang’ (p.r.: 50-350Hz)<sup>9</sup>.

The two eight-syllable APs seen in the previous examples are highlighted below as Figures 37 – 38, both show windows of 1.8 – 1.9 seconds, and are in the same, 50-350Hz pitch range. In both figures a flat horizontal line has been added to show how in Figure 37 the underlying LHLH pattern has not surfaced clearly. The visible tonal pattern appears to be

<sup>9</sup> It is unclear why the second LH sequence, the L target at the end of the first word, and the slightly higher H target at the beginning of the second word, surfaces—this remains an exploration for further research as focussed items seem to receive an initial H tone, as shown in Section 4.4. Impressionistically, [tannaʃ] *does* sound more emphasised than other words within the AP. However, this only explains the H tone at the beginning of the second word, and not the L tone at the end of the first word. There is a possibility that the AP-final tone is La when the AP modifies the following head noun AP, but the current data only include a couple instances of this phenomenon.

LLH, with a slight rise on the second or the third syllable. Notwithstanding, the tonal pattern for this AP is still LHLH, even though the final high is *very slight*: the F0 is slightly higher on the second syllable than on the first, and slightly lowered on the third syllable (impressionistically there also seems to be a rise on the second syllable). For contrast, a sentence with each word constituting its own AP is shown in Figure 39, also with a horizontal line.

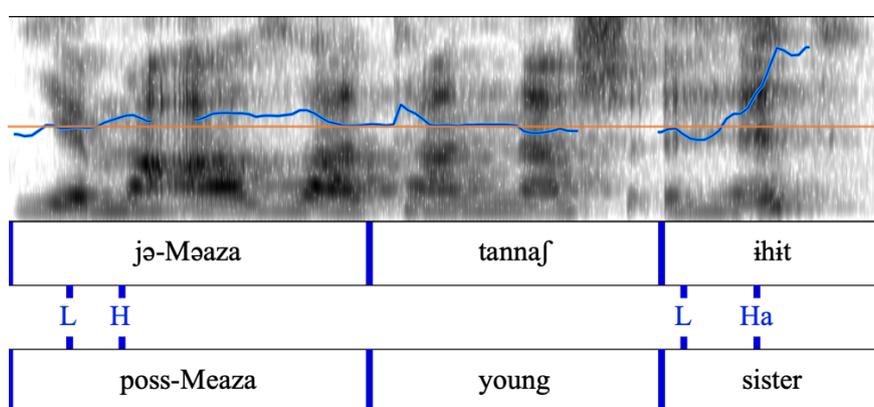


Figure 37. Spectrogram for the AP /jəmæaza tannaʃiħit/ 'Meaza's young sister'.

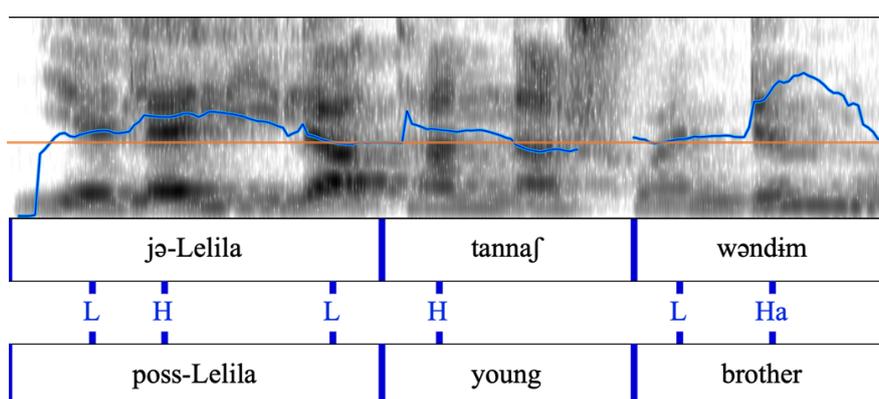


Figure 38. Spectrogram for the AP /jələlila tannaʃwəndim/ 'Lelila's young brother'.

In contrast, Figure 38 illustrates that the underlying tonal pattern *has* surfaced clearly, as evinced by the high pitch roughly aligning with the second syllable of the AP. The penultimate syllable has a very clear low pitch before the sharp AP-final rise. This indicates

that the underlying pattern in Amharic may surface to varying degrees, with the degree to which it surfaces being an optional matter.

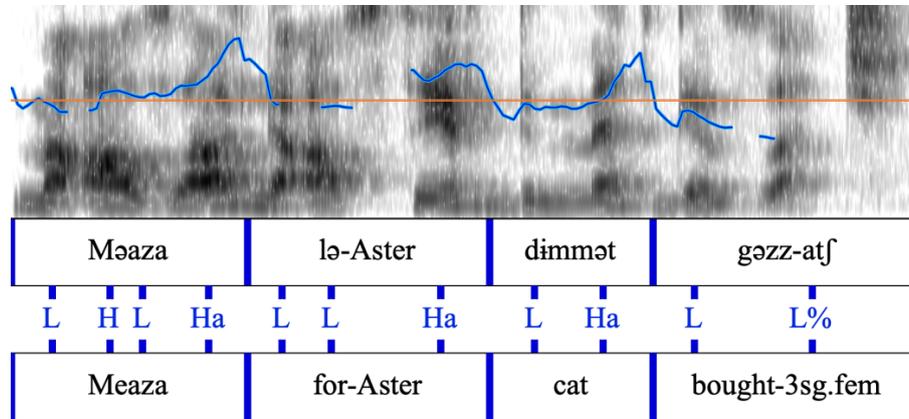


Figure 39. Spectrogram for /məaza læaster dɪmmət gəzzatʃ/ 'Meaza bought a cat for Aster' (p.r.: 50-300Hz).

#### 4.3.3 Origins of Initial High

There are two possible explanations for the optional initial high seen in these data, one which may be connected to stress. One is that the initial high, which usually occurs on the second syllable, is triggered for rhythmic reasons, and is typologically common, found in other AP languages (e.g., Korean, French, Tamil). The second question is whether the initial high in phrasal contexts could be triggered by vestigial remnants of pitch accent in citation forms. If this dialect of Amharic had pitch accent in phrasal contexts, but has been since lost, could these sometimes surface as an optional initial high on the basis of faithfulness to the citation form? If this were the case, we would expect the initial high to appear on the syllable that corresponds to the stressed syllable of a given word. However, if an AP is small enough, it might not allow for the initial high to surface on the syllable it should be on. In languages with 'rhythmic' initial high, the location is typically on the second syllable of a word longer

than two syllables, regardless of the location of lexical stress. For example, a trisyllabic word with initial stress still shows an initial high on the second syllable. It could be the case that the initial high shifts to the second syllable so as to not interrupt or overwrite the higher priority AP-initial low tone (refer back to the prosodic hierarchy proposed in Figure 35). Following this same logic, a word with lexical stress later in the word would also show initial high on the second syllable (e.g., /mə.nə.záz.zə.r-ə/ ‘he exchanged money repeatedly’, with lexical stress on the penultimate syllable of the stem, should still show the initial high on its second syllable). As shown earlier, the tonal pattern over ‘Lelila’ (Figure 29) vs. ‘for Lelila’ (Figure 32), shows the initial H is realised on the second syllable of an AP regardless of the location of the stressed syllable. In the data collected, there were no instances of words with a high tone on an initial syllable, indicating that the phrase-initial low tone takes precedence over an initial high on any initial syllable, whether it be associated with lexical stress, or with rhythmic reasons.

Below is a table showing phrases and instances where a L tonal target aligns with a stressed syllable, as Alemayehu would predict, and instances where this is not the case. We see both happen within the same phrases and sentences, as the table illustrates. It is important to keep in mind that a L tonal target in these data is not low enough to constitute a low PA as Alemayehu posits. Further, the alignment of these L tonal targets with stressed syllables is due to phrase-initial words having stress on a word-initial syllable, rather than because that specific syllable is stressed.

Table 4. Low tone on stressed vs unstressed syllables\*

Fig. #	L on ó	Fig. #	No L on ó
22	<i>'newari 'indziner k'emma</i>	27	<i>rədʒdʒim-wa 'lidʒ kə- 'ahijja laj wəddək'ətʃ</i>
23	<i>'wələdʒ 'wəmbər t'ərrəbə</i>	28	<i>jə- 'abate 'k'ondʒo 'mist aləkkəsətʃ</i>
24	<i>'hakim 'lomi bəlla</i>	29	<i>lelila lə- 'haile mela sət'ətʃtʃiw</i>
27	<i>'rədʒdʒim-wa lidʒ kə-ahijja laj wəddək'ətʃ</i>	32	<i>dawit lə- 'lelila billa gəzza</i>
29	<i>'lelila lə-haile 'mela sət'ətʃtʃiw</i>	34	<i>jə- 'məaza tannaʃ ihit tanəbbalətʃ</i>
30	<i>'kətəma-w bə-məret mənək'ət'k'ət' tegodda</i>	36	<i>jə-lelila tannaʃ wəndim zəffənə</i>
31	<i>'samuna 'bət'am t'ru 'məaza alləw</i>		
32	<i>'dawit lələlila 'billa gəzza</i>		
33	<i>'t'ilik'u 'betəsəb bə- 'bet wist jinoralu</i>		
34	<i>jə-məaza tannaʃ 'ihit tanəbbalətʃ</i>		
36	<i>jə-lelila tannaʃ 'wəndim zəffənə</i>		
39	<i>'məaza lə- 'aster 'dimmet gəzzatʃ</i>		

\*Words in italics are relevant for their respective column. Syllables carrying low tone are shown underlined. All words in italics will have stress marked by the IPA stress diacritic (') for easy cross-comparison with location of low tone.

#### 4.4 Farasani Arabic vs Amharic: Typological Comparison

These data on Amharic stress and a basic declarative intonation are reminiscent of the case of Farasani Arabic (hereinafter: FA). FA has lexical stress predictable based on syllable weight, and shows a H\* pitch accent on a word produced in isolation (Abbas & Jun, 2022), similar to the H peaks seen in Amharic words in isolation. Data of neutral focus sentences in FA shows that the intonation contour of an AP consists rising edge tones, and like the Amharic AP, can be given the tonal label [L Ha]. However, FA narrow focus data show evidence of pitch accent in APs. Abbas & Jun (2022) found that a narrowly focused word has a lengthened stressed syllable which carries a sharp rising tone, LH\*. They also

found evidence of pre-focal dephrasing—the focussed word and all preceding words form one AP, with the focussed word being the last word in the AP, and a tonal pattern [L LH\* La]. All post-focus words were observed to constitute one single AP.

These findings on FA APs that show no pitch accent in broad focus, but do show it in narrow focus, prompted the evaluation of narrow focus data in Amharic to determine whether stress might also surface as a pitch accent in this context. Corrective focus data was collected, and the results were found to be inconclusive. In some cases the intonation was extremely similar to a broad focus declarative, and in others there was some difference, seen in representative examples in Figures 40 – 41, respectively.

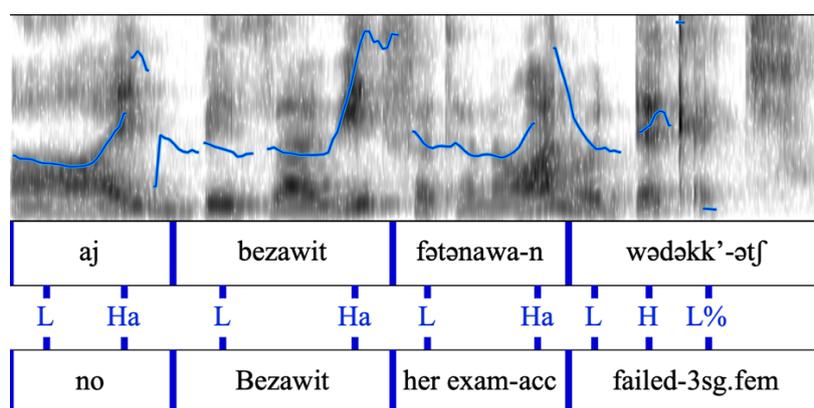


Figure 40. Spectrogram for /aj bezawit fəṭənawan wədəkk'ətʃ/ 'no, Bezawit failed her exam' (p.r.: 75-400Hz).

Figure 40 is not significantly different from a declarative sentence in that we see the same [L Ha] tonal pattern for each AP as in broad focus declarative sentences. In fact, this sentence looks like it could be a sentence without any corrective focus. The sentence in Figure 41, however, shows that corrective focus sentences can also have different tonal pattern from declaratives. Here we do not see the repeating [L Ha] tonal pattern for each AP. Instead, we see that from the end of the H tone on the AP /aster/, F0 drops a little and remains

relatively flat until sharply dropping from the end of /ʃinbra/ to the copula, /nəw/. There is no visible AP-final rise on the last syllable of the AP, i.e., the AP /ʃinbra/. The focussed constituent in Figure 43, where the pre-coupla word (/gəbərə/ ‘farmer’) does show an AP-final H tone, suggests that the final syllable of /ʃinbra/ may carry an AP-final H tone. The F0 of the first syllable is about the same as that of the last syllable, (i.e., not a L tone—the typical AP-initial tone). First, the high F0 of the focussed word’s initial syllable was checked to see if it is due to lexical stress, as in FA. The focussed word ‘chickpea’ /ʃinbra/ is two syllables long, and the high tone aligns with the stressed syllable. However, ‘old’ /ʃiməgəliw/ is four syllables long, and has stress on the antepenultimate syllable, while the high tone aligns with the first syllable, and does not correspond with the location of lexical stress. Comparing the focussed word in Figure 43, /ʃiməgəliw/, with the focussed word in Figure 41, /ʃinbra/, we can see how the first syllable of the focussed element appears to carry a H tone. In /ʃinbra/ the pitch range appears lower than that of the preceding word, /aster/, making these H tones seem as if they are not actually high. Consequently, we see a sudden drop from /bra/ to /nəw/, emphasising that /bra/ does carry an AP-final H<sub>a</sub> tone. If there were no H target on the last syllable of /ʃinbra/, the F0 should fall smoothly from /bra/ to /nəw/.

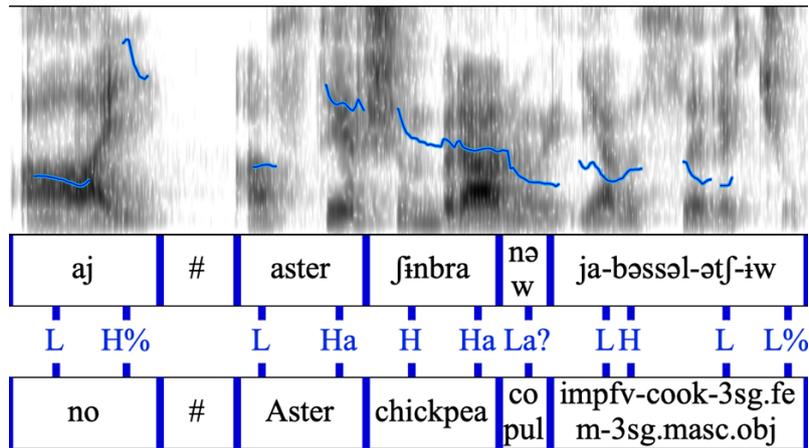


Figure 41. Spectrogram for /aj, aster ʃɪnbra nəw jabæssələtʃiw/ ‘no, Aster cooked chickpeas’ (p.r.: 75-375Hz).

In this sentence, we have an instance of phonetic dephrasing after the focused element: there is a slight break after the copula, and the verb still maintains AP phrasing based on the F0 pattern, but with a compressed pitch range and reduced amplitude (see Figure 37) (Jun, 2011: 214; 2019: 121-122).

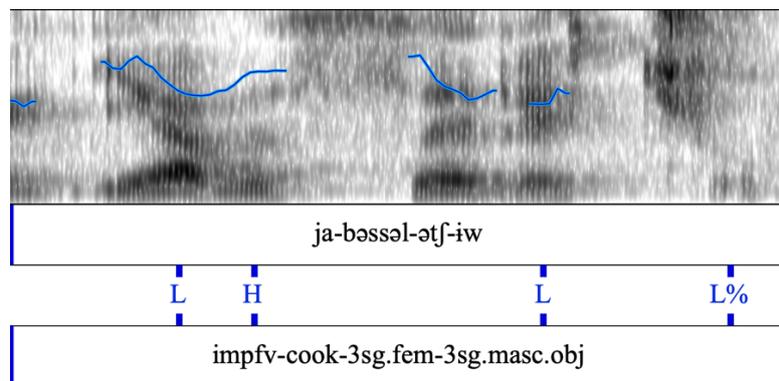


Figure 42. Spectrogram for post-focused verb in Figure 35 with pitch range reduced to 75-200Hz.

Figure 42 shows that this post-focused element, the verb, is still a whole AP. Apart from the high F0 at the onset of /j/, which might be triggered by the laryngealization of /j/, we have a low pitch on the /a/, the first vowel of the verb, and a clear rise to an initial high on the second syllable of the verb, showing the initial high pitch we have previously seen, and supporting this as an instance of phonetic dephrasing, and not phonological dephrasing. Another instance of phonetic dephrasing is found in Figure 43. After the NP containing the

focused element, there is a break followed by the remainder of the sentence. Taking a closer look at this post-focal phrase with a reduced pitch range, we also see that it still follows the AP phrasal pattern (Figure 44); there is a [L L Ha] tonal pattern for the first AP, and we see the [L H L L%] tonal pattern on the phrase-final verb.

Although the data for corrective focus are insufficient to determine what the tonal pattern of an Amharic focus phrase is, they do shed some light on these constructions. Together with the sentence in Figure 45, we can see that a corrective focus sentence is very similar in structure to a declarative sentence, except for the addition of the copula /nəw/ after the element that is being focused. The high tone on the initial syllable of a focussed element can be interpreted as a focus-triggered high.

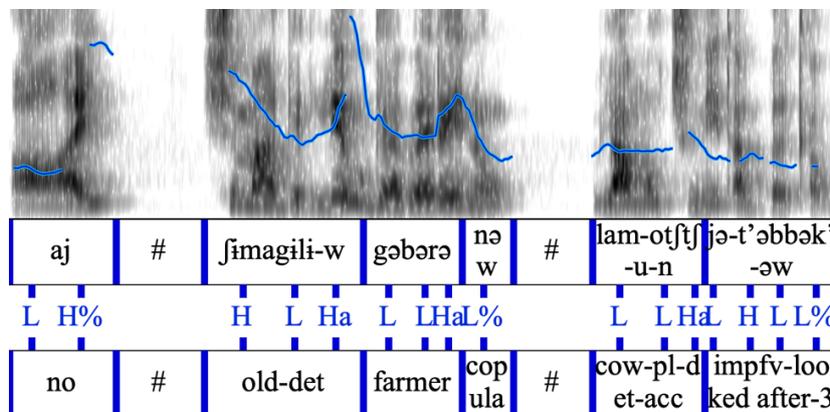


Figure 43. Spectrogram for /aj ʃimagiliw gəbərə nəw lamotʃʃjun jət'əbbək'əw/ 'no, the old farmer herded the cows'.

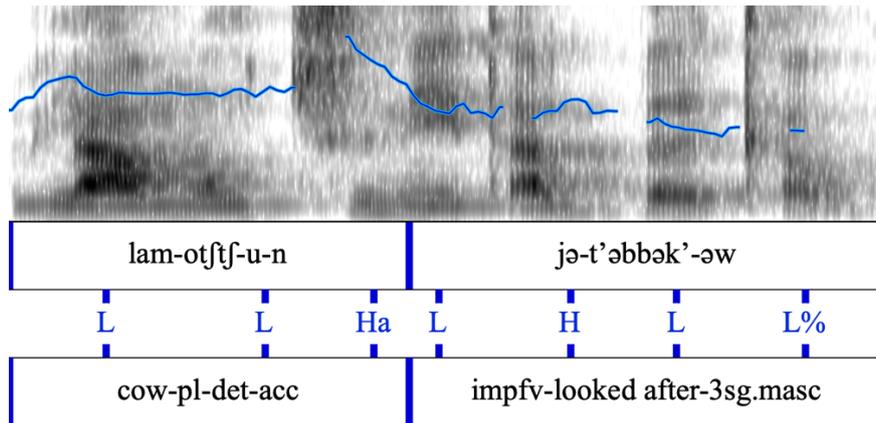


Figure 44. Spectrogram for post-focused phrase in Figure 43 with pitch range reduced to 75-225Hz.

The focussed element in Figure 45, ‘ugly’ /ask’əjami/, shows a similar tonal pattern.

The word initial syllable has a high pitch, while the antepenultimate syllable is the one that carries stress.

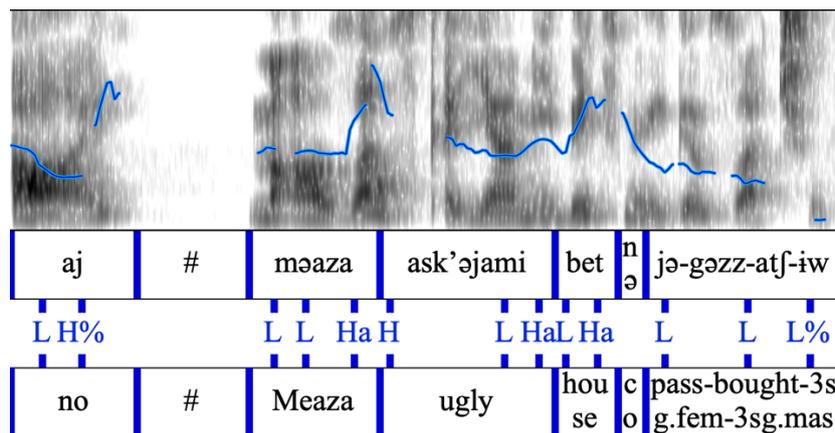


Figure 45. Spectrogram for /aj, məaza ask’əjami bet nəw jəgəzzatʃiw/ ‘no, Meaza bought an ugly house’ (p.r.: 50-450Hz).

This is evidence that focussed word-initial high is not associated with the stress syllable, but rather with a focus-triggered boundary tone—more data are required to be certain. A possible argument for this is that the copula seems constrained to *not* disrupt the structure of the NP containing the focussed element, as in ‘the old farmer copula’ in Figure 43, and ‘ugly house copula’ in Figure 45. With just the copula, the whole NP is designated as

being focused, so the addition of the initial high on the actual focussed element, ‘the old,’ serves to pinpoint which element within the NP is the focussed.

The original declarative sentence that Figure 41 is based on is ‘Aster cooked the chickens’, so the corrective element of Figure 41 is ‘chickpea’ (in italicised text). Here we encounter the copula immediately following the word for ‘chickpea’. In contrast, in Figure 43 we see that the copula appears after corrected phrase ‘the old farmer’ from the original sentence ‘the young farmer herded the cows’. The location of the copula is therefore predictable based on what the focused element of a sentence is: it is found after the NP of the focused element. The NP is not broken to narrowly focus the adjective. It is also worth noting that in Figure 40 there is no copula. The reason for this could be that the focused element is the verb (from the non-corrected sentence ‘Bezawit passed her exam’), as opposed to some word from another category.

These corrective focus data demonstrate that Amharic is unlike FA in that pitch accent still does not play a role in the formation of sentence intonation, even in a narrow focus context. Were they to be similar, some effect of pitch accent would have been expected on the stressed syllable of the focused element. Instead, we see again that Amharic does not allow pitch accent to be involved in intonation; stress remains suppressed in both declarative and narrow focus contexts. Amharic employs both a copula and a possible high tone on the initial syllable of the narrowly focused element to demarcate a focussed element.

#### 4.5 Possible Influence of External Factors in Loss of Status of Stress

As noted in the overview of previous publications, some authors explicitly mention that they consider Amharic to have lexical stress, while the rest do not indicate what kind of stress they believe Amharic to have. Historical or geographical aspects have not been discounted, as they may have contributed to the loss of the status of stress in Amharic intonation.

Historically, Amharic has been the dominant language in Ethiopia since the 12<sup>th</sup> century. It has not been subject to repression, which could have caused changes based on characteristics of the dominant language. More recently, as of the 1990s, Oromo—a Cushitic language—stopped being repressed by the government. Oromo is the most widely spoken language in Ethiopia in terms of native, first language speakers, resulting in a high degree of language contact. Oromo has lexical stress, marked by a high pitch accent on the final or penultimate syllable (Owens, 1985).

Geographically, Ethiopia is relatively mountainous (see Figure M1, below), containing the largest continuous mountain ranges in Africa, as well as vast fertile plains and valleys. This does not seem to have caused a lot of differences between dialects. Although there is no mention of large differences between dialects, Hayward & Hayward (1992) do mention that the ‘most divergent dialect is that of the Gojjam province.’ However, they do not mention the degree of difference between the Gojjam dialect and more ‘standard’ dialects. My consultant is a speaker of Addis Ababa Amharic, which Hayward & Hayward note as having

‘emerged as the standard dialect and has wide currency across all Amharic-speaking communities’ (Hayward & Hayward, 1992: p. 48), and therefore we do not expect my consultant to show unusual characteristics in her speech.

Given these historic and geographic points, it is unclear why my speaker’s dialect of Amharic is perhaps different from the dialects described by some other authors. That is, it is not clear why they claim to see free lexical stress in the dialect(s) they are describing, but we see fixed stress only in isolation in the Addis Ababa dialect of my consultant. Contact with another language that *does* have lexical stress would lead us to believe that maintaining lexical stress would be encouraged, more so than the opposite, which we have seen from these data. The establishment of the Addis Ababa dialect as the standard dialect also does not help explain why this dialect has no lexical stress, or why the status of stress has been lost in phrasal contexts.



Figure M1. Physical map of Ethiopia.

#### 4.6 Section Conclusion

To summarise and consolidate my claims, Amharic has lexical stress that is stem-bound, assigns antepenultimate stress to non-verbal stems, and penultimate stress to verbal stems, and is demarcated by high pitch. The lack of status of lexical stress in the formation of intonation in Amharic is evidenced by the suppression of any F<sub>0</sub> peaks or changes in Accentual Phrases in phrasal contexts, with an underlying demonstrative tonal pattern of [L H L Ha]. In these contexts there is data suggesting that the underlying LHLH tonal pattern, mostly seen in longer APs, is simplified to be rhythmically acceptable. The initial H appears to be optional, but the penultimate L often surfaces when an AP is longer than two syllables, resulting in [L Ha] for two-syllable APs, and [L L Ha] for APs three syllables or longer. Although some corrective focus data was analysed for a focus tonal pattern, it was inconclusive and should be further examined, together with other kinds of narrow focus such as wh-question/answers, to fully understand the focus prosody of Amharic and to see whether stress really plays no role in the formation of intonation in focus contexts. The focus data was also unable to shed any light on whether it may be related to vestigial remnants of pitch accent. Both historical and geographical factors have also been considered to account for the lack of lexical stress in phrases of the Addis Ababa dialect, as well as the lack of status of stress in intonation.

## 5 Literature Survey of Stress Distinctions

In the sections below, I dissect the claims of authors introduced in Section 2. Their claims are tested against the findings I have thus far presented. Only claims that are not supported by the data and analysis presented in Section 4 will be addressed. Any claims not mentioned should be understood to agree with the proposals made in the previous section. For examples that support each of the claims discussed below, refer to the comparative table at the end of Section 2.

### 5.1 Domain of Stress & Stress-Attracting Suffixes

Both Armbruster (1908) and Mullen (1986) imply that the domain of stress is a whole word based on the examples they provide (see Table II for respective examples). Sande & Heddig (2017) explicitly state that they consider the whole word to be the domain of stress (S&H, 2017: 6). As was shown in Section 4.1, in Figures 9 – 16, the domain of stress appears restricted to the stem of a word. The addition of multiple suffixes of varying types causes no shift in the position of high pitch.

The various suffixes proposed to attract stress may be reanalysed as not attracting stress based on the proposed domain of stress. If the domain is strictly the stem, then these suffixes should not be able to carry stress or affect the position of it. Notwithstanding, for transparency, examples to illustrate this are shown below in Figure 46. These are the nominal /and/ ‘one’ and two derivations, /and-əŋŋa/ ‘first,’ and /and-əŋŋa-nnət/ ‘championship.’



closed by a geminate, and therefore heavy. Recall that heavy syllables under their account spread alternating stress both left- and rightwards. Since intensity is the main correlate of stress in their accounts, they lead us to believe that the first and third syllables should have a high intensity peak. The word in Figure 47 shows this to not be the case; the initial syllable has low intensity, while the third syllable does show a peak. Additionally, if stress were to be indicated by intensity *and* pitch (S&H, 2017: 5), we would expect to see a higher intensity peak aligning with the stressed syllable, but this is not the case.

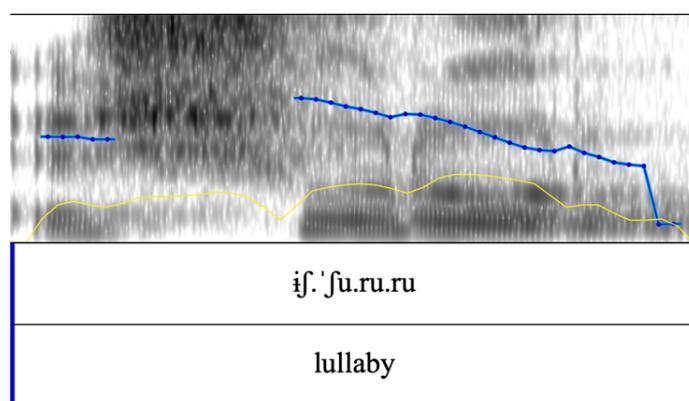


Figure 47. Spectrogram for ‘lullaby’ /iʃʃururu/.

Another such example is seen in ‘green-plural,’ which contains only one heavy syllable under their accounts, the plural suffix /-otʃtʃ/ (VG). If intensity is the main cue stress, we should see the main intensity peak aligning with the vowel of the suffix, and ‘secondary’ stress (which I am assuming to display slightly lower peaks of intensity) on the vowels for the first and third syllables—/a/ and /g<sup>w</sup>a/ respectively. Figure 48 shows us that this is not the case. There is no moment of high intensity during the vowel of the plural suffix, just a slight downwards plateau.

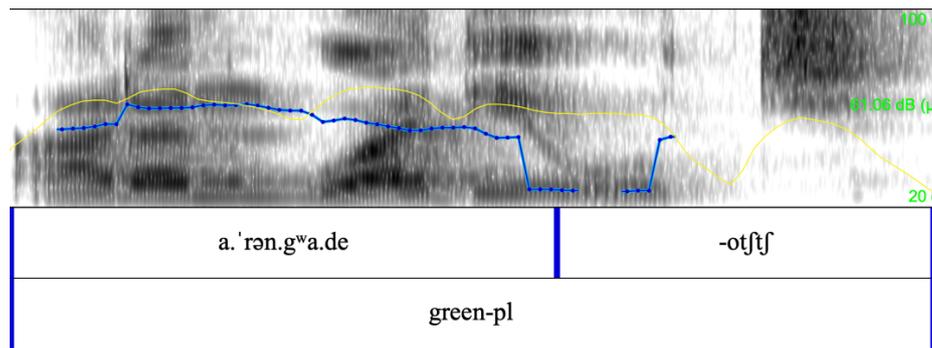


Figure 48. Spectrogram for 'green-pl' /arəŋgʷadeotʃtʃ/.

Although there is a moment of high intensity aligned with the syllable /gʷa/, there is none for /a/, where they expect one as a result of heavy syllables projecting stress. Rather, there is an intensity peak that aligns with the second syllable of the stem, which happens to be the stressed syllable based on high pitch alignment.

Although Sande et al. attempt to control their stimuli and stay away from sentence-level intonation, they do include two-word phrases. Data presented in Sections 4.2 – 4.3 demonstrated how two-word phrases behave differently from words in isolation in terms of their pitch tracks. This is likely a confounding variable that has influenced their analysis and their positing intensity as the main correlate for stress. For example, in Figure 49 we have a two-word phrase with the syllable composition CVG.CV CVC, which S&H and Sande et al. would stress as /léb.ba nǎw/.

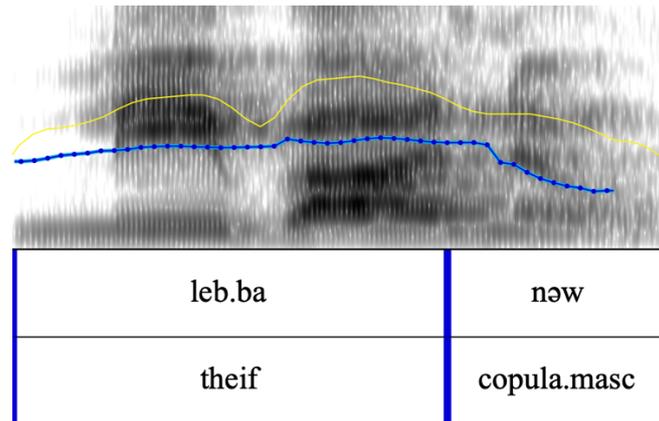


Figure 49. Spectrogram for /ləbba nəw/ 'he is a thief' with intensity.

The peak of high intensity instead aligns with the one syllable they predict to be unstressed—this happens to be an AP-final syllable that also carries high pitch. This is perhaps indicative that an AP boundary could be demarcated by higher intensity in addition to high pitch, and warrants further investigation.

### 5.3 Fixed vs Free Stress

#### 5.3.1 Fixed Stress

The proposals for fixed stress by Alemayehu (1987) and Leslau (1995) are predominantly in line with the findings of this paper. The main difference lays with Leslau's account of tetrasyllabic words, which he posits have penultimate stress. Evidence shown in Section 4.1, Figures 9 – 10, indicates that these words actually carry antepenultimate stress, with the high pitch portion aligning with the antepenultimate syllable (e.g., /i.ʃán.gu.lit/ 'toy' and /ig.zí.ab.her/ 'God').

### 5.3.2 Free Stress

Claims of free stress, by Mullen (1986), Sande & Heddig (2107), and Armbruster (1908) specifically for non-verbs, are countered by the data and discussion in Section 4. Examples presented in Figures 11 – 23 illustrated how stress remains fixed on the same syllable of them stem in all words in isolation, even in light of suffixation with geminates (e.g., /wǎm.bə.r-otʃ.tʃ-u/ ‘the chairs’ (Figure 50) and /ti.-fál.li.g-al.l-ətʃ/ ‘she will want’ (Figure 11).

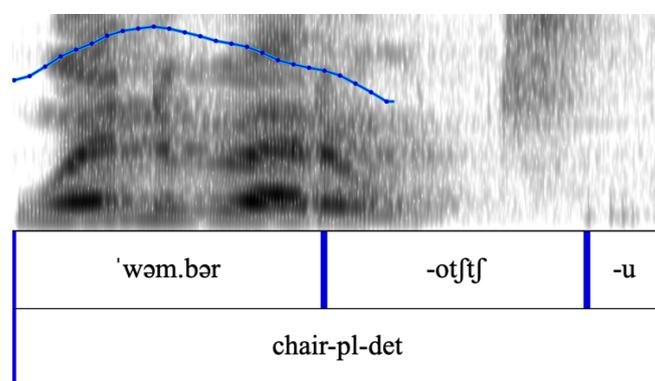


Figure 50. Spectrogram for /wǎmbərotʃtʃu/ ‘the chairs’.

Proposals of multiple stresses per word (Armbruster, 1908, S&H, 2017) are also discounted by these data, as all instances of single word utterances have shown only one high pitch portion per word (Figures 7 – 16).

### 5.4 Stress Shift

The shifts in stress presented in Section 2.4, proposed by Alemayehu (1987), Mullen (1986), and Leslau (1995) in compounds and two-word phrases have been reanalysed as the right boundary tone of an AP. They propose that stress in these constructions shifts to the last syllable of the first word. In these short phrases each word constitutes an AP, which

carries high pitch on its last syllable from the AP-final tone, Ha, as in Figures 12 – 17, for example (see Sections 4.2 – 4.3 for an illustration of the Amharic AP and its boundary tones).

## 6 Conclusion

To summarise stress, Amharic has lexical stress that is assigned to the head syllable, antepenultimate in non-verbal forms, and penultimate in verbal forms. The domain of Amharic stress is strictly within the stem, and is suppressed in phrasal contexts. Stress is indicated by a high pitch aligning with the head syllable. In multi-word declarative phrases, the presence of stress is suppressed and we see a clear tonal pattern for the boundary tones of an AP, which may consist of more than one word: [L Ha]. Each AP, seemingly regardless of length, shows this [L Ha] pattern. APs that are at least three syllables will always show a [L L Ha] pattern, while the degree to which the [L H L Ha] pattern surfaces seems to be optional. The general tone pattern seen in phrase-final APs, optional high aside, is [L L%], with the default AP-final Ha tone being supplanted by the IP final L%.

A comparison of the claims made by previous publications with this analysis and these data show that lexical stress is present only in isolation, with edge-prominence in phrasal contexts; a novel proposal that seems to address the lack of consensus of previous authors. Although their analyses differ from each other, parts of some of them still hold true under my proposed approach, hopefully consolidating over a century of disagreement on Amharic stress.

The contributions of this paper to the study of stress and phrasal intonation may best be framed in terms of Alemayehu's proposed system of stress. Alemayehu's analysis is based on a very small dataset of no more than a few dozen words, and limited phonetic evidence to support his proposals that high pitch is indicative of stress in isolation—for which he provides no ICDs. He only includes a small handful of ICDs to support his claim that stress is marked with a low tone in declarative contexts. This paper has not only examined a larger databank, with more varied word structures, but also provides phonetic evidence that indicates that high pitch *does* demarcate the stressed syllable in utterances produced in isolation. Analysis of the phonetics of Amharic stress in declarative contexts allowed for Alemayehu's proposed low tone on stressed syllables in this context to be reformed into the present proposal of phrasal tones demarcating phrase boundaries. Additionally, this process resulted in finding a phonetic cue that is consistent in designating the stressed syllable in isolation—a point of dispute amongst previous publications. This investigation yielded further interesting findings from a typological perspective with respect to stress and phrasal intonation, which has not been previously explored. Amharic can now be categorised alongside languages like Farasani Arabic and Bengali insofar as there is stress and also phrasal tones marking the edges of Accentual Phrases. Based on these findings, this paper has opened up avenues for further research on Amharic that are typologically and intonationally engaging.

Further research on this topic should be sure to use data from more than one speaker to account for inter-speaker and dialectical variations. Along with the relatively limited dataset, especially for the intonational analysis, having only one consultant is the largest shortcoming of this paper. An investigation of a wider variety of verbal forms is also warranted, as all those examined here had at least one suffix. The imperative form is the only bare-stemmed verbal form, and could shed more light on the location of high pitch on verbal stems. A more systematic examination of other cues of stress is also warranted. Having a statistical analysis of the pitch, intensity, and duration of stressed syllables in single word utterances in isolation would help solidify the claims made about stress. This examination should also address the what happens to the stressed vowel in phrasal contexts in terms of phonetic cues. Previous work on Amharic stress has grouped nouns and adjectives together. A large part of Amharic adjectives are derived from other words, usually verbs, with various suffixes. A more in depth exploration of different adjectival forms could show that perhaps not all adjectives align with nominals.

In terms of the intonational model of Amharic, a first step should investigate more complex syntactic structures, such as embedded PPs and the intricacies of possessive constructions, to determine how those tonal patterns differ from that of a simple declarative utterance. Further, narrow focus constructions should be more carefully analysed, and with a wider range of data to eliminate any uncertainties in the current proposal.

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