

A preliminary model of Singaporean English intonational phonology*

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Abstract

Recent research has sought to identify the systematic features that make Singaporean English (SgE) distinct from other varieties of English. Although the intonation of SgE has been described previously (Deterding 1994; Lim 2004; Ng 2011), no phonological model has yet been proposed. This paper proposes a model of SgE intonational phonology within the Autosegmental-Metrical phonology framework (eg. Pierrehumbert 1980). Three native speakers were recorded reading declarative and question sentences of varying length and stress pattern. Preliminary results suggest that SgE has three prosodic units above the word: the Accentual Phrase (AP), Intermediate Phrase (ip) and Intonational Phrase (IP). An AP is slightly larger than a word and is characterized by a general LH (rising) contour. The L can be attributable to either an L* tone on a lexically-stressed syllable or an L initial boundary tone if the stressed syllable occurs late in the AP. The AP-final syllable always has a phonologically high boundary tone (Ha). Intermediate phrases are marked by L- and H- tones and IPs are marked by L% and H% tones. Finally, preliminary data suggests that SgE speakers use an expanded pitch range and occasionally lengthening to mark contrastive focus.

1 Introduction

Singaporean English (SgE) has been argued to have emerged as a nativized variety of English due to contact with languages such as Malay and Southern Chinese languages such as Hokkien (Platt & Weber 1980, Ho & Platt 1993). Unlike in other colonial settings, there is no evidence that SgE is the result of the development from a pidgin or creole (Gupta 1998). Recent research has acknowledged the fact that SgE has systematic features that set it apart from other varieties of English (e.g. Wee & Ansaldo 2004). This is also true of the prosody of SgE which displays a number of characteristics that make it distinct from Standard British English (e.g. Low et al 2000). While the intonation of SgE has been described previously (Deterding 1994, Lim 2004, Ng 2011), no phonological model has yet been proposed. This paper, thus, proposes an intonational model within the Autosegmental-Metrical framework (Pierrehumbert 1980, Beckman & Pierrehumbert 1986) of intonational phonology for SgE.

This paper is organized as follows: in section 2, I present a brief background on SgE, operationalizing what is meant by SgE given Singapore's complex linguistic situation and discussing relevant research on its prosodic characteristics. Section 3 briefly presents the method by which the data was collected. In section 4, I present the proposed intonational model of SgE. Finally, in section 5, I conclude by outlining some of the outstanding questions regarding the proposed model and suggesting future directions for research in SgE intonation.

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2 Singaporean English

2.1 Variation in Singaporean English

English is the official language of instruction in schools in Singapore. In addition to this, students generally also learn one of Mandarin Chinese, Malay or Tamil at school, depending on their ethnic background. Approximately two-thirds of the population is ethnically Chinese, and Mandarin Chinese is the most commonly spoken language at home (Singapore Department of Statistics 2010). Most of government business is conducted in English as well. Taken together, most of the population is bilingual to varying degrees, with English being one of the languages in which they are proficient.

Like any other variety of English, SgE displays much variation. As Deterding (2007) suggests, however, it is unclear how best to characterize this variation. Two main threads can be found in the literature. The first sees the variation in SgE in terms of an acrolectal and basilectal distinction (Ho & Platt 1993). Gupta (1998), adopting a somewhat similar standpoint, adopts a diglossic model in which Colloquial SgE is the L(ow)-form used in casual situations and Standard SgE is the H(igh)-form used in formal situations. Specifically, she argues that Colloquial SgE is different enough from Standard SgE that it should be analyzed on its own terms. In contrast to these views where there is a sharp distinction between Colloquial and Standard SgE, Pakir (1991) proposes a continuum that is based on two dimensions: (1) formality of the given situation, and (2) the speaker's proficiency in English. This approach emphasizes the fact that speakers choose the language they use from a range of styles where Colloquial and Standard SgE are the endpoints of the continuum.

In the present paper, I adopt a diglossic model. Specifically, SgE is defined as Standard Singaporean English, since we can reasonably assume that when reading speakers will adopt the H-form. I leave open the question of whether an intonational model can capture patterns of both lects (or the continuum) for future work.

2.2 Some prosodic characteristics

SgE exhibits a number of characteristics that sets it apart from Standard British English (BE), the variety of English with which it has been compared the most. Firstly, it has been argued that SgE is unlike BE in that it is a syllable-timed language (Low et al 2000). Low et al (2000) showed that there is less variability in successive vowel durations in SgE than in BE; that is, vowels are produced with more equal durations. Moreover, reduced vowels are produced more peripherally in the vowel space in SgE than in BE. Low et al (2000) argue that these acoustic characteristics provide evidence for the cross-dialectal differences in rhythm.

It has also been noted that stress in polysyllabic words in SgE differ from the same words in BE (e.g. Platt & Weber 1980), shifting stress to the final syllable in a word such as *flawlessly*. Low and Grabe (1999), however, point out that this stress-shift has only been noted in intonation-phrase-final position. Instead, they argue that this apparent lexical stress shift is a result from intonational boundary phenomena. In their study, they found that there was substantially more phrase-final lengthening in SgE than in BE, which they attribute to the perceived stress on the final syllable.

In terms of prominence, it has been noted that unlike in BE, SgE does not cue prominence via pitch, particularly a high pitch (Tan 2006), instead it seems as though intensity is the primary cue for prominence. Interestingly this also seems to depend on the ethnicity of the speaker (Lim and Tan 2001). With regards to intonation, Deterding (1994) argued for four tone types (rising, falling, rise-fall and level) whose domain was the word. He argues that, in general, it is hard to identify a single word that is prominent in an utterance. With regards to stress, he notes

that content words tend to be stressed while function words are generally not. He does suggest, however, that demonstratives and modals appear to receive stress more often in SgE than in BE. Ng (2011) also notes that object pronouns (but not subject pronouns) and certain prepositions do in some cases receive stress (see also Platt & Weber 1980). Ng (2011) further showed that there was a strong correlation between stress, vowel intensity and duration of consonants and vowels.

Interestingly a number of authors have noted the close relationship between lexical stress and tone assignment in SgE. Most recently Ng (2011) argues for the following generalizations governing the relationship between tone and stress (p. 36):

- (1) Tone assignment
 - a. High tone (H) is assigned to the final syllable of the phonological word.
 - b. Mid tone (M) spans all all non-final stressed syllables.
 - c. Low tone (L) is assigned to initial unstressed syllables.
 - d. Remaining unstressed syllables may remain unspecified for tone or receive mid tone by rightward spreading.

Ng's (2011) analysis departs from Deterding's (1994) in positing the domain of tone to be the syllable, arguing essentially for categorical tone that is predictable from the stress placement on a word. Despite the generalizations proposed, however, Ng (2011) also notes that there seem to be inter-speaker differences, especially when comparing data collected by Siraj (2008 in Ng 2011). Most notably she argues that a medial unstressed syllable can either be unspecified for tone or receive a mid tone (see examples in §4.1.1 below). While Ng (2011) leaves open the question of the interaction of categorical tone and higher level prosody, her analysis does not preclude the possibility that at least some of the tones that she has argued for could be the result of intonational phenomena. Admittedly, Ng (2011) focuses on Colloquial SgE and it is unclear to what extent her observations would carry over to Standard SgE, and vice-versa. Due to the constraints of the present paper, I do not discuss the differences between Ng (2011) and the present model.

3 Method

The present study is based on a small corpus of data collected from three native speakers of SgE: a 20-year-old female speaker, a 24-year-old female speaker and a 27-year-old male speaker. The two females reported using English most often at home, while the male speaker reported using Mandarin Chinese more often. All three speakers were university-educated.

Speakers were recorded using laptop-internal microphones. They produced sentences of varying length, stress pattern and type. As much as possible, this was done in a quiet space to ensure that the pitch tracks were clearly visible. Recordings were then segmented and labelled, and pitch tracks were examined using Praat (Boersma & Weenink 2011). Pitch tracks were analyzed by locating peaks and valleys in each utterance.

4 Model

It is proposed in this paper that SgE is a head- and edge-prominence marking language. Evidence has been found for one pitch accent type: a low tone, L*. There is also evidence for three levels above the word: the Accentual Phrase (AP), the Intermediate Phrase (ip) and the Intonational Phrase (IP). For the AP, I propose an initial aL low boundary tone and a final Ha high boundary tone. In the present paper, preliminary evidence is presented to argue for the existence of a phrasal constituent between an AP and IP, that is, an Intermediate Phrase (ip). In the current data, there is preliminary evidence for both a L- tone and H- tone that mark the

right edge of an ip. Finally, at the IP level, two boundary tones, L% and H% are proposed.

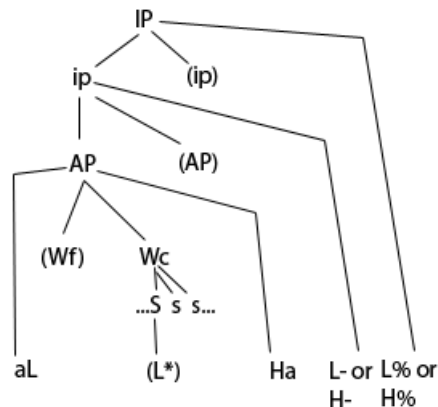


Figure 1: Proposed prosodic structure of SgE. Wf = function word, Wc = content word, S = stressed syllable, s = unstressed syllable

Figure 1 provides a schematic of the proposed hierarchical structure of the model. APs seem to contain only one pitch accent, suggesting that the domain of pitch accents are the AP. APs contain one or more words, but it seems as though each AP can generally contain only one content word, with the possibility of a number of preceding function words. Intermediate phrases (ip) contain a number of APs and can be marked by an L- or H-. Lastly, IPs contain one or more ips and are marked on the right edge with a boundary tone, L% or H%. Whether tones of higher prosodic units override those of lower prosodic units is unclear from the present data, though there is some evidence to suggest that this is not the case. This, however, is one avenue in need of future investigation.

In the following sections, I discuss the properties of each prosodic unit and associated tones, presenting evidence for the proposal.

4.1 Accentual Phrases (AP) & Pitch Accents

An AP in SgE generally consists of one content word and zero or more preceding function words. An AP-final H boundary tone (Ha) is realized on the final syllable of the accentual phrase. Another L tone marks the left edge of the AP (aL). Taken altogether, the tonal melody of an AP is characterized by a rising contour due to the LH tone targets across the AP. The present model also posits a single type of pitch accent in SgE: L*. This L* pitch accent, however, is occasionally optional. It is admittedly not clear whether an L* pitch accent is necessary for us to account for the patterns we see. In fact, it has been argued elsewhere (Deterding 1994) that it is hard to determine which word in a sentence is prominent. However, the L* pitch accent is required, at the very least, to account for some patterns in the present data. In this paper, L* pitch accents are only labelled in a word which has a low F0 and is perceived as prominent. They are not labelled if F0 is high or when prominence on the stressed syllable is not perceived. In cases in which the initial syllable of an AP is also prominent, it is marked with both aL and L*.

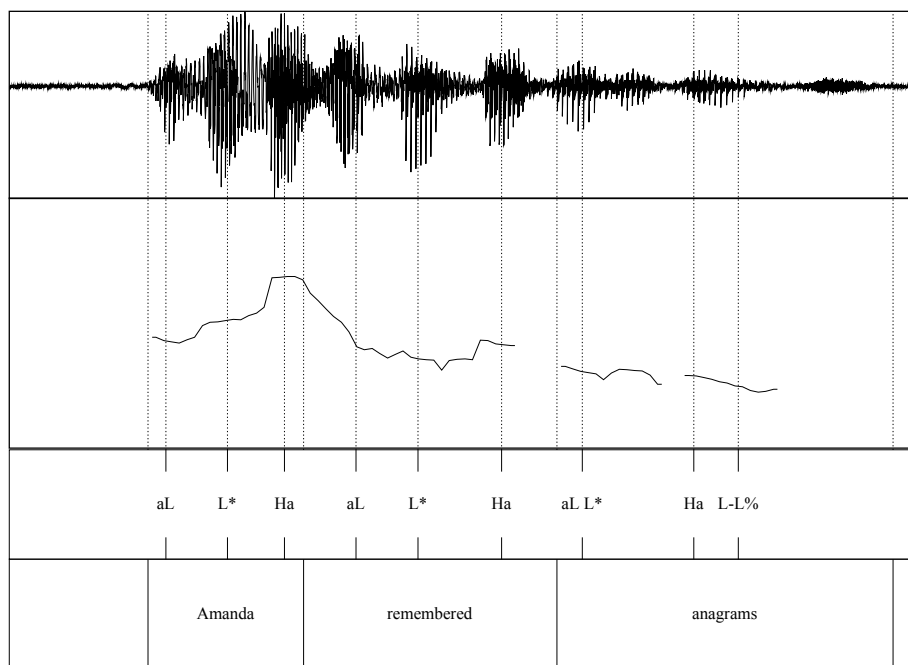


Figure 2: *Amanda remembered anagrams.*

In Figure 2, we see a clear rising contour on *Amanda*. F0 then lowers in *remembered*, reaching a valley on the second syllable, presumably meeting an L* target. The F0 raises a little on the last syllable before falling again during *anagrams*. What we can see from this example is that the initial AP (*Amanda*) has a larger pitch range and successive APs show successively reduced pitch range. This pattern of the initial word being produced with a larger pitch range has also been observed previously, most notably by Deterding (1994) and Low & Brown (2005). Deterding (1994) suggests that this extremely high pitch corresponds to the introduction of a new topic. The rising contour of aL Ha is most evident in the initial AP since this is where there is the largest pitch range. In fact, we also see this contour in monosyllabic APs as can be seen in Figure 3.

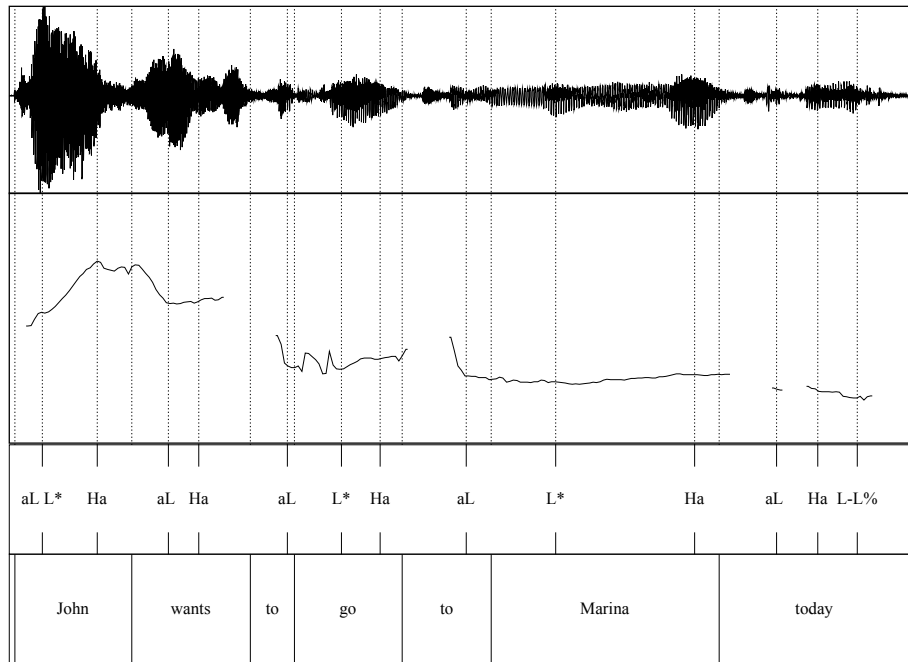


Figure 3: *John wants to go to Marina today.*

The rise on *John*, which on its own constitutes an AP, is suggestive that all the tonal targets aL, L* and Ha are met, at least in initial position, even when there is only one syllable for all these tones to be realized. In the second AP, *wants*, there seems to be an L target initially, but we see a plateau as opposed to a rise. Here, it seems as though the aL target was undershot and is only realized with a high peak.

Undershot of the aL is not the only way in which the phonetic realization of the phonological shape of an AP can vary. Consider the following example in Figure 4.

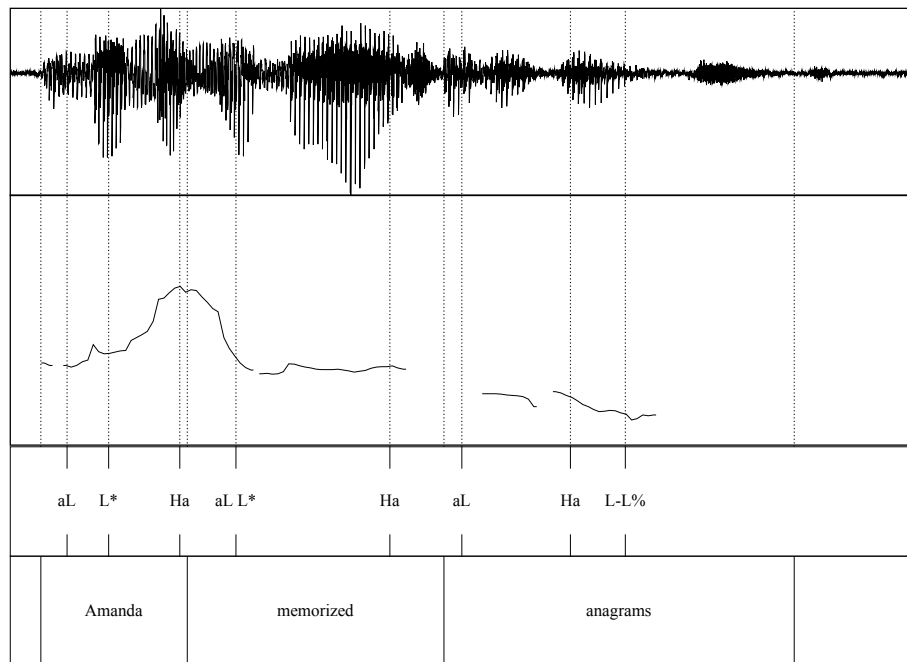


Figure 4: *Amanda memorized anagrams.*

We saw a minimal pair of this sentence in Figure 2. The only difference between the two sentences is the medial verb. In the first case, *remémbered* is stressed on the medial syllable and in the second *mémorized* is stressed on the initial syllable. Whereas in Figure 2 there is an actual rise phonetically on the last syllable, in the Figure 4, the contour is a flat plateau across the entire AP, before falling again on the third and final AP of the sentence. That is, it seems as though the AP-final Ha is not always realized as phonetically high, especially outside of the initial AP. The plateau contour on the medial AP in figure 4 does not seem to be an isolated case, as we see in Figure 5.¹

¹I have labelled the final Ha with a question mark since F0 is lower in the final syllable than the preceding syllable. It is unclear whether or not this means that the boundary tones of the higher prosodic units, L-L%, overrode the final H.

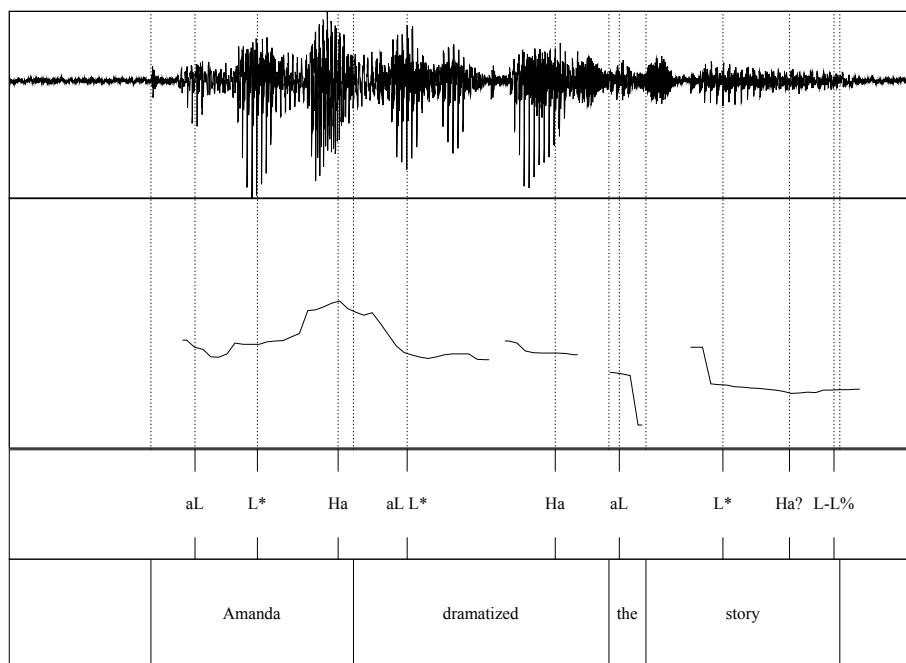


Figure 5: *Amanda dramatized the story.*

Crucially, in these cases where we see a plateau in F0, F0 stays relatively level against declination. This has the result then of giving the percept of a final rise despite the lack of an actual rise in pitch phonetically. What seems to determine the presence or absence of a rise on the final syllable of the AP is the placement of the L* pitch accent. In words such as *remembered* and *collided* the pitch accent is on the medial or penultimate syllable, whereas in the other cases, such as *dramatized* and *memorized*, stress and thus the L* pitch accent is further away from the final syllable. The rise in these cases seems to be a function of wanting to ensure the perception of a final high signalling the AP boundary. When the pitch accent occurs earlier in the AP, a plateau is maintained for longer against declination which is enough to give the percept of a final high. When the L* pitch accent is realized adjacent to the final syllable, on the other hand, a final rise is necessary to actually cue the AP-boundary. Whether or not this generalization extends to other longer words with similar stress patterns remains to be seen. If there is free variation in the surface realization of the LH contour, the question will then be whether or not an L* pitch accent is actually necessary at all in the model.

4.1.1 Longer words in initial position

So far, it has been argued that an AP contains at minimum a content word and that it is characterized by a rising contour. Longer words in sentence-initial position, however, seem to show some variation from this general pattern. These words occasionally show a medial H tone such that the contour becomes LHLH within the AP. In Figure 6, we see a H tone on the second syllable of *watermelons* followed by a low on the following syllable.

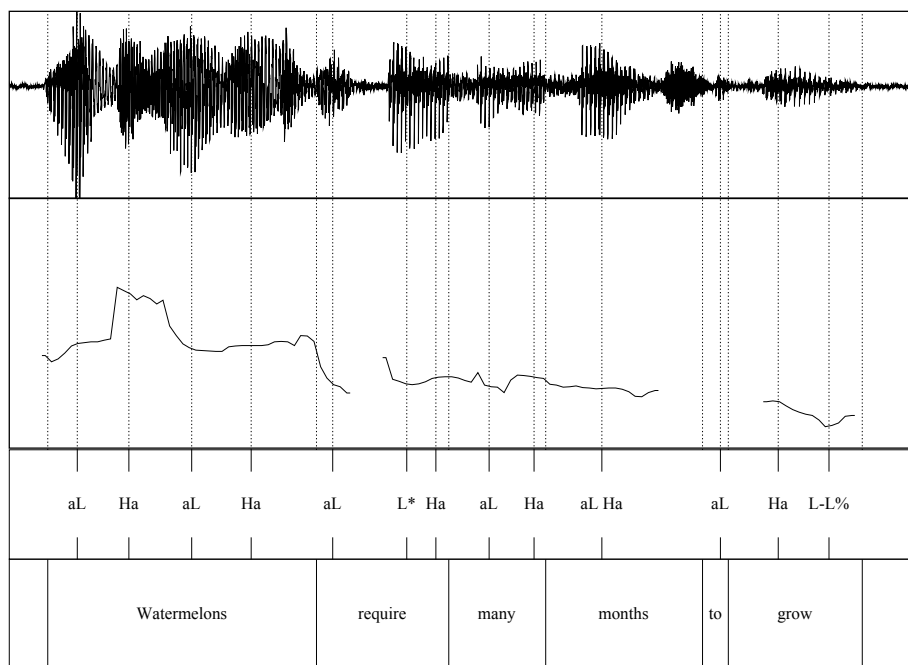


Figure 6: *Watermelons require many months to grow.*

In Figure 6 above and other figures in this section, I have only labeled whether or not a tone is H or L and have not made a claim about the phonological status of these tones that we see word-medially. A possibility is that speakers interpret words such as *watermelon* as a compound, thereby parsing the first word, *water* into an AP of its own. Similarly, in Figure 7, the word *modifications* shows a rise on the first three syllables then another rise on the final two syllables.²

²It has been pointed out that the height second H tone differs in the two cases. In Figure 6, this is lowered in comparison with the initial H, and in Figure 7 it is approximately the same height as the preceding H tone. This might suggest that we may be looking at two different patterns. In the former case, the word is actually parsed into two different APs and in the latter it is not.

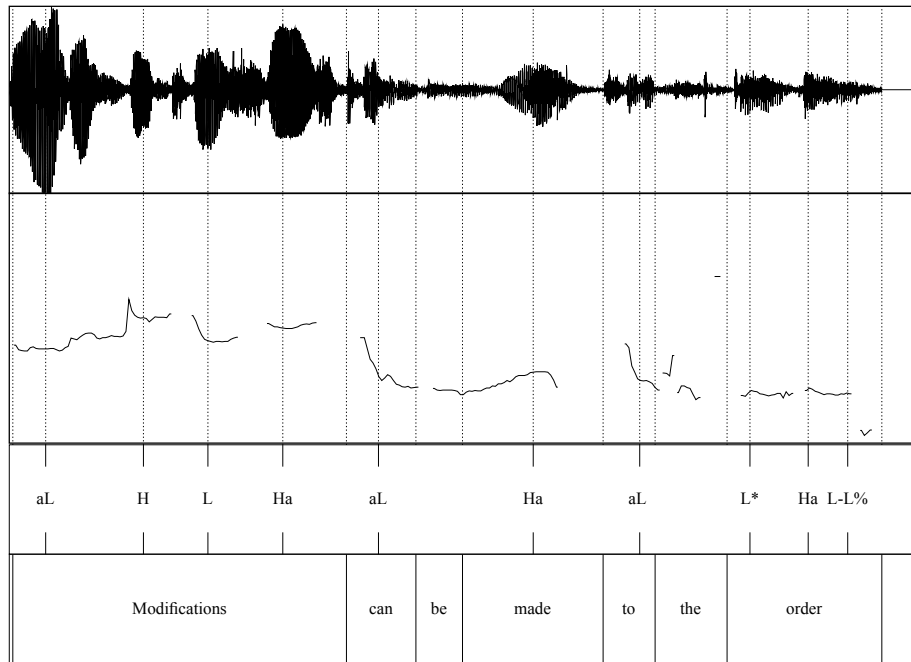


Figure 7: *Modifications can be made to the order.*

Yet other words of similar lengths do not show this pattern. Consider Figures 8 and 9. In both cases, on *psychologically* and *allegations*, we see a general rising contour across the entire word and we do not see an extra H tone in the middle of the word. These words are not compounds, but they are morphologically complex as *modifications* is. A question to be answered is how long does a word have to be before a medial H tone is inserted. In Figure 8, it is also interesting to note that the object pronoun *me* seems to also receive a H tone, which begs the question of how these are being parsed prosodically.

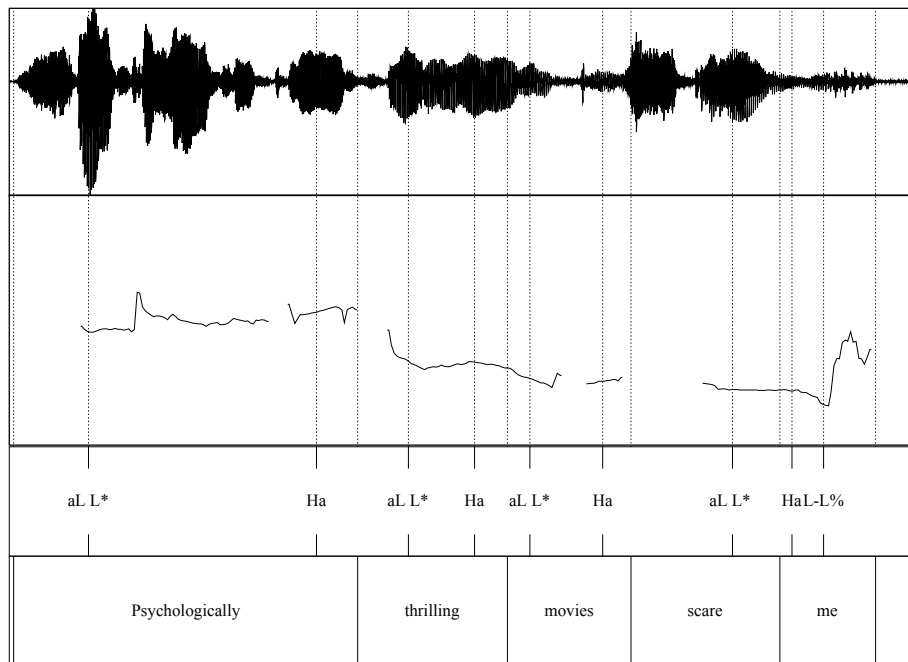


Figure 8: *Psychologically thrilling movies scare me.*

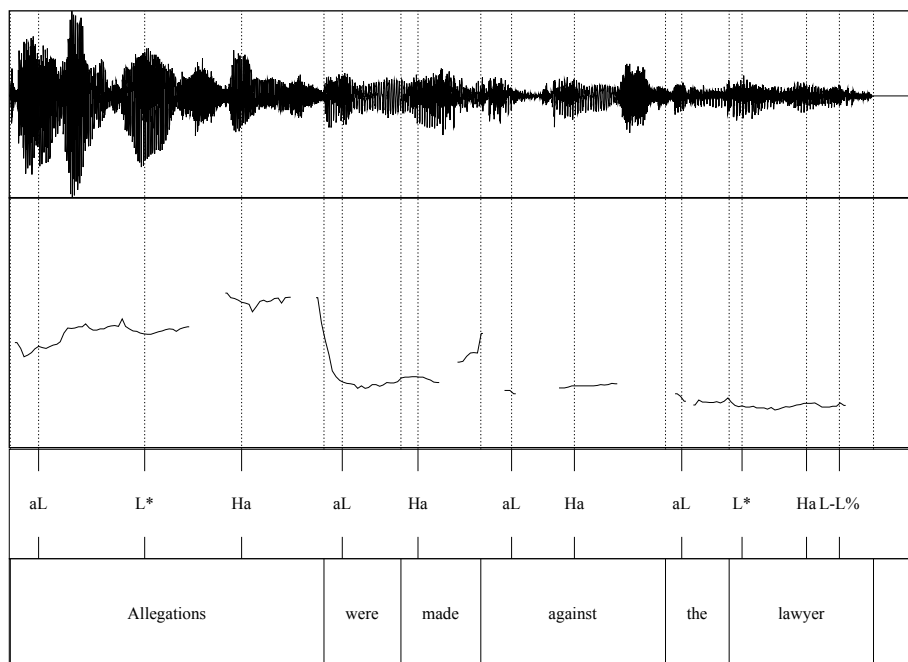


Figure 9: *Allegations were made against the lawyer.*

Further interesting cases of variation involve morphologically complex words such as *unremarkable* or *irreparable* with a prefix. An example is shown in Figure 10. Here, it seems as though the prefix receives a H tone and forms an AP on its own, a fact that is not accounted for by the current model. Whether or not other prefixes show this pattern and whether we see this pattern when the word is not in initial position require further investigation.

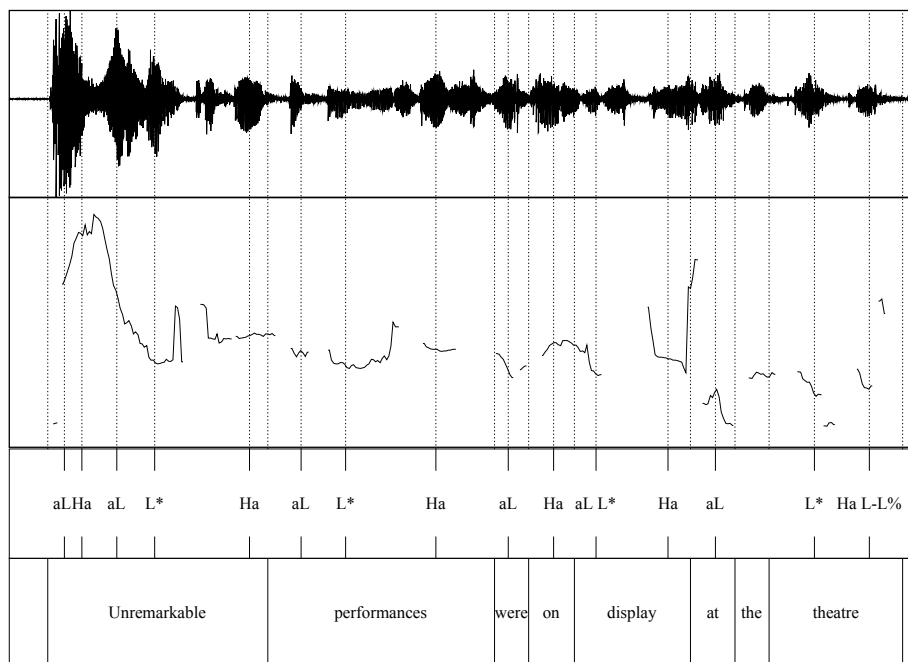


Figure 10: *Unremarkable performances were on display at the theatre.*

The variation in tonal realization in longer words of similar lengths has been noted by Ng (2011) and others (eg. Siraj 2008 in Ng 2011) who assign tone at the lexical level in Colloquial SgE. Some examples of these are shown in the following examples:

- (2) *élephant* (MMH) (Ng 2011)
- (3) *Pánama* (MHH) (Siraj 2008)
- (4) *psychólogically* (LMMMMH) (Ng 2011)
- (5) *repáirability* (LMHMH) (Siraj 2008)

The insertion of another H tone is interesting for a number of reasons. Firstly, it is unclear what exactly conditions the H tone that surfaces within the AP and why it occurs in certain cases and not others. Additionally, it begs the question of whether or not SgE allows for the AP domain to be smaller than a single word. If the word-medial high tone is indeed an Ha then we would have evidence to suggest that SgE is similar to languages like Chickasaw (Gordon 2005) which allows for the AP domain to be smaller than a morphological word. Moreover, it is unclear whether we are seeing a similar pattern in all the cases presented above. It is also not certain from the present data if this is only something we see when words are in initial-position

or a pattern that occurs regardless of position in a sentence. Teasing these details out would require more tokens of compound like words and morphologically complex words that share similar phonological shapes, and varying its position in the IP.

4.1.2 Pronouns

Generally, subject pronouns which are function words do not form their own APs. This is evident in the following example in Figure 11. Here, we notice that the initial pronoun does not receive a H tone but instead patterns as we would expect, forming an AP with the following verb.

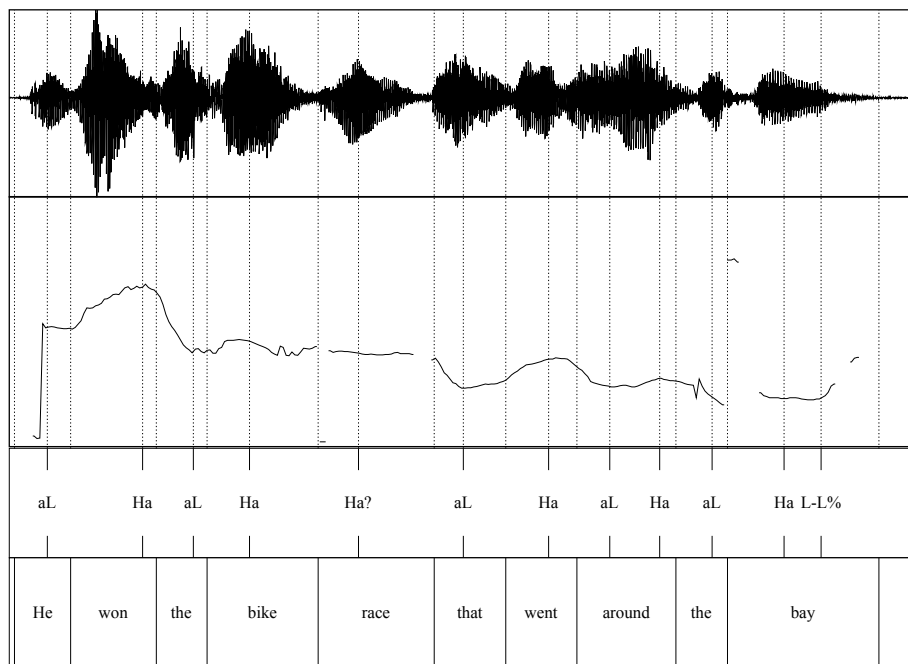


Figure 11: *He won the bike race that went around the bay.*

When conjoined with another pronoun, however, the first pronoun receives a H tone on its own. Here *you* constitutes a separate AP from the following *and I*.

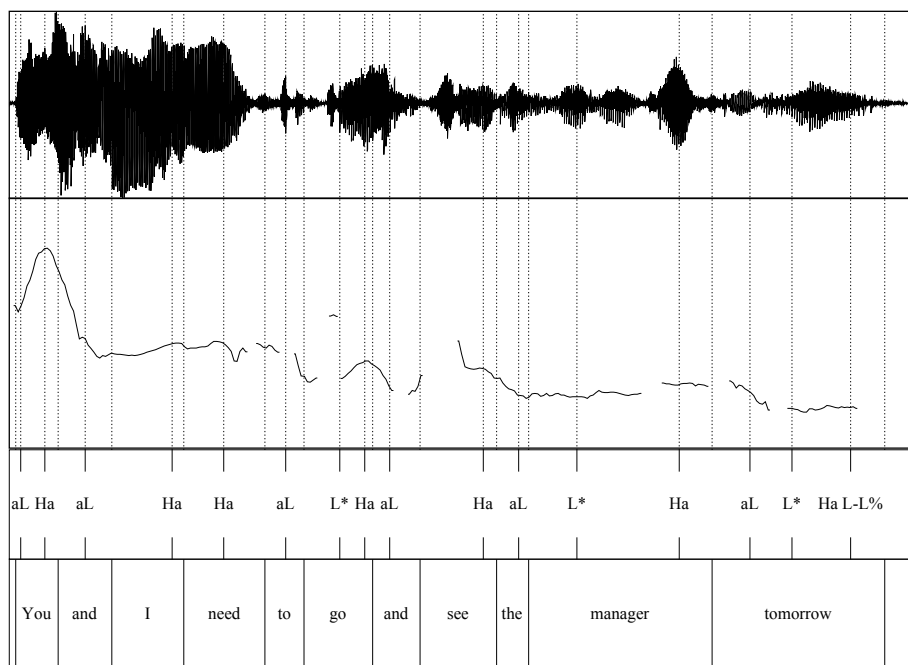


Figure 12: *You and I need to go and see the manager tomorrow.*

Why this is the case is unclear. One potential explanation is that this H tone could be the result of some other phenomenon, perhaps focus. It is also unclear as to whether or not this is pitch accented, and if so whether or not we would require a new pitch accent: H*. The implications of this pattern require further investigation.

4.2 Intermediate phrases

Intermediate phrases in SgE contain a number of APs. Consider the following sentence in Figure 13.

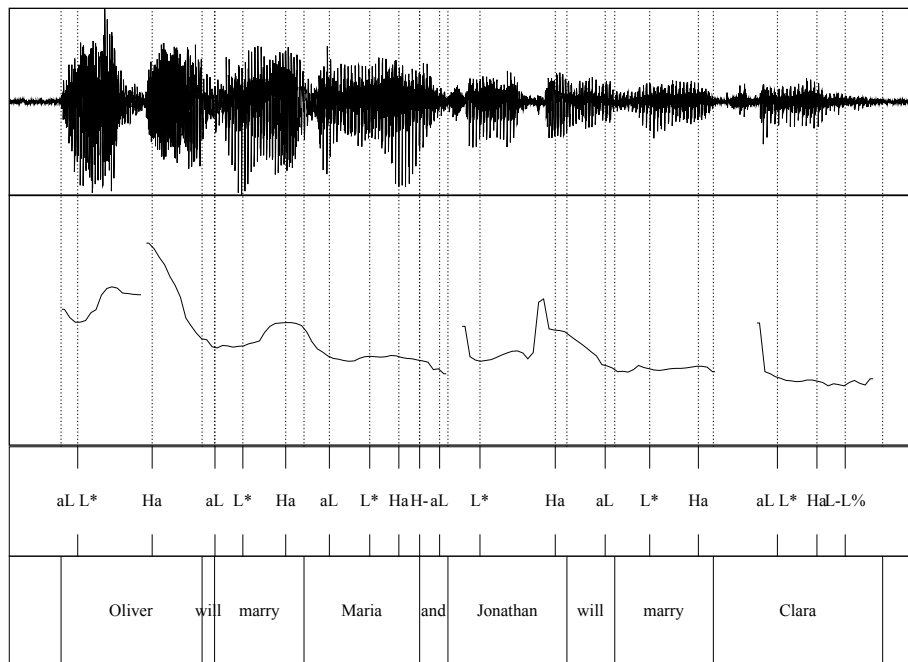


Figure 13: *Oliver will marry Maria and Jonathan will marry Clara.*

The left edge of of an ip can be characterized by pitch reset. The pitch of the ip-initial AP is not lowered in comparison with the previous AP as we would expect, nor is there a reduced pitch range in comparison. We can point to two ip-final tone types: H- and L-. H- tones are realized either as a flat plateau continuation of the Ha or a further rise on the final syllable of the ip. L- tones seem to only realized IP-finally. We see a H- tone of the first of the plateau type in Figure 13 at the end of *Maria*. We see a H- tone of the rising type in Figure 14 at the end of *Amanda*.

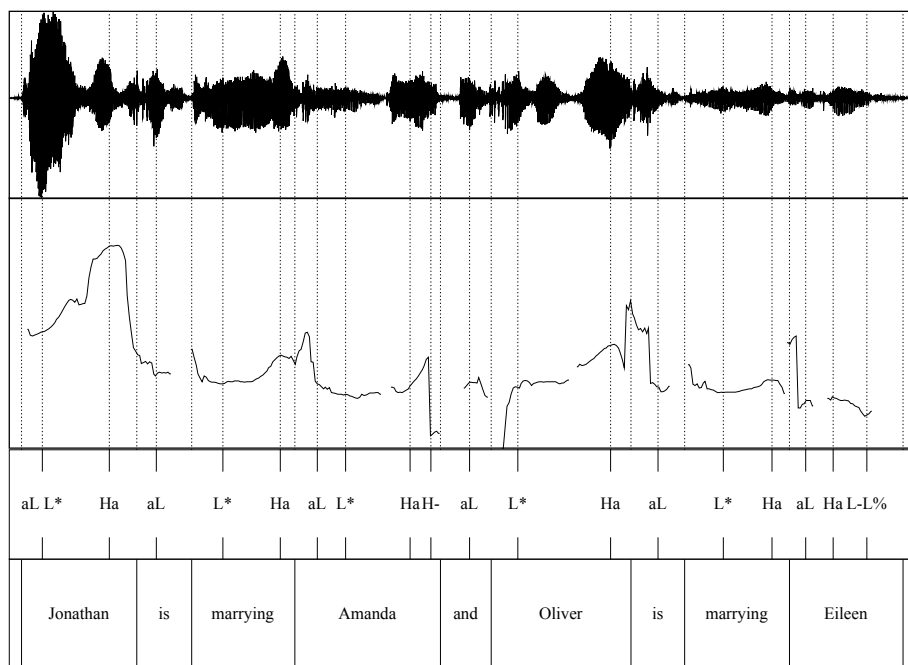


Figure 14: *Jonathan is marrying Amanda and Oliver is marrying Eileen.*

An L- ip tone is evidenced at the end of declarative sentences and wh-questions as can be seen in at in IP-final position in Figures 13 and 14 above.

4.3 Intonational Phrases: H% vs. L%

Intonational Phrases (IP) are the largest tonally marked prosodic unit in SgE and are usually the size of a simple sentence or a large phrase. A boundary tone is realized on the final syllable of the IP. There seems to be evidence for two different IP-final boundary tones, L% and H%. Declarative sentences and wh-questions end in L% and yes-no questions end in H% tones. We have already seen declarative examples above with an L% tone finally. Figure 15 shows a wh-question with a L%.

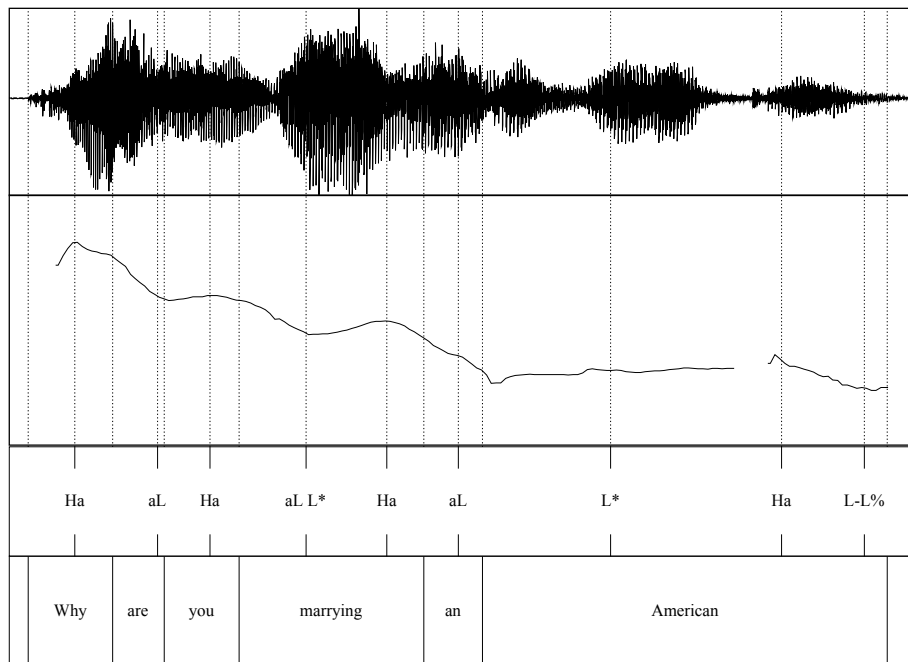


Figure 15: *Why are you marrying an American?*

Notice that there is a small rise on *American* and then a final fall. What this suggests is that the Ha of the AP is still realized together with L- and L%. This gives us potential evidence that there is no tonal override of higher prosodic constituents, unlike in other languages such as Bengali (Khan 2008).

An example of a yes-no question with a final H% is shown in Figure 16. Here we see a rising contour on the final syllable of *tomorrow*. This presumably is the result of the realization of Ha, a H- and H% all on the one syllable.

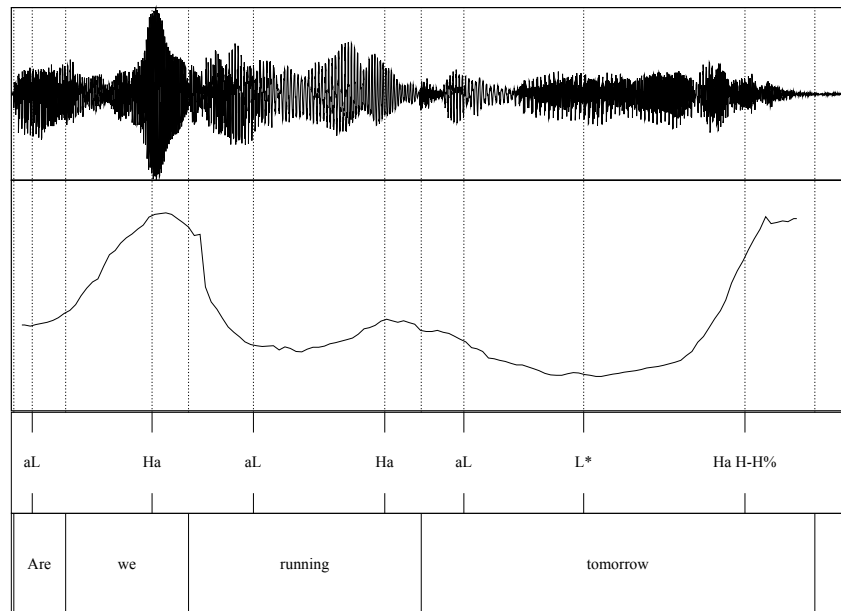


Figure 16: *Are we running tomorrow?*

4.4 Focus

In this study, a small amount of data concerning strategies for marking focus in SgE was collected. Data was collected for instances of contrastive focus. Preliminary evidence suggests that speakers generally use an expanded pitch range on the focused item. In Figure 17, we see large rise at the end of *Amanda* suggesting that the AP-final Ha tone is boosted.

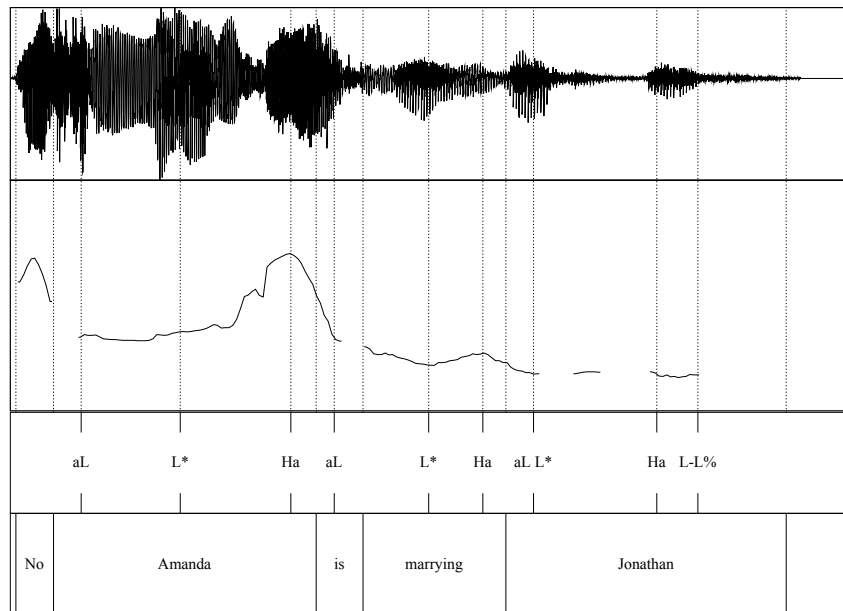


Figure 17: *(No) Amanda is marrying Jonathan.*

We see a similar pattern in Figure 18 where the focused word is *drove*.

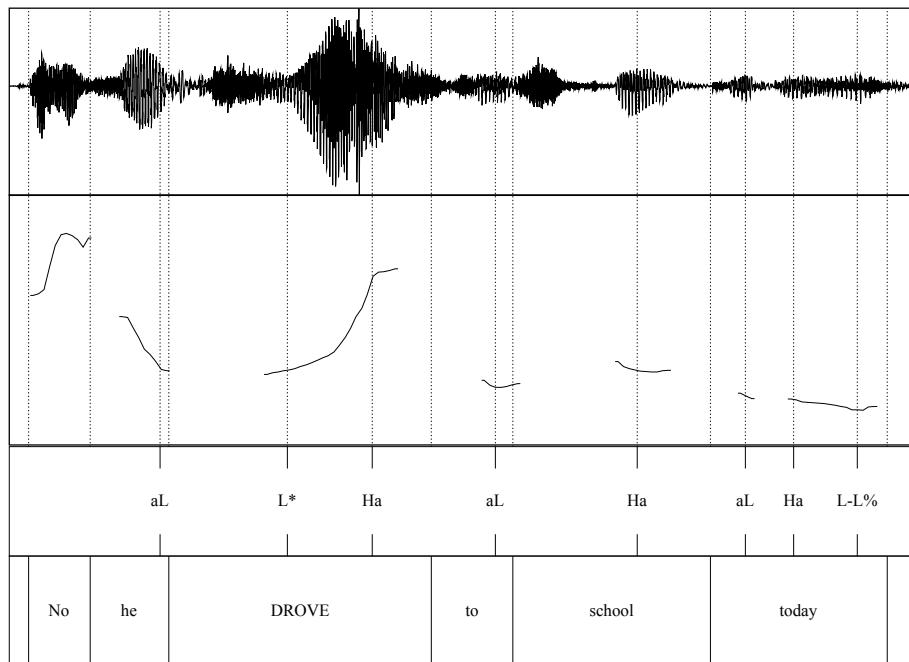


Figure 18: *(No) He drove to school today.*

When the focused word is not in the initial AP, however, the pitch range is not expanded to the same extent as we saw previously. An example is shown in Figure 19. We do still see a comparatively larger rise on the final syllable of *Amanda*, one that is larger considering the reduced pitch range. Additionally, there seems to be lengthening of the stressed syllable as well, possibly another strategy to cue focus in a position where the pitch range is reduced. Further investigation on how focus is realized will shed light on whether or not different strategies are used depending on where the focused word's position in the IP.

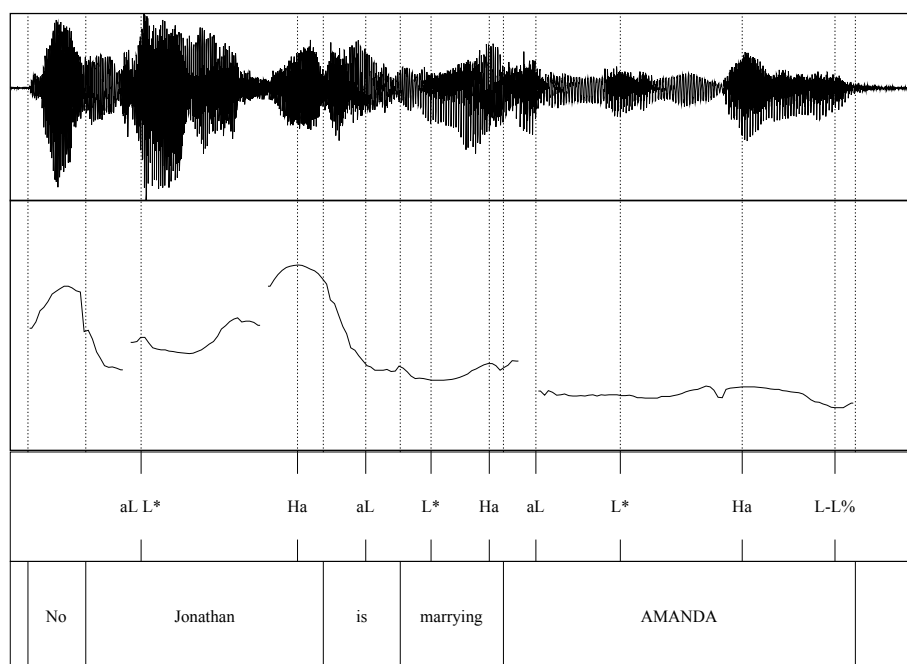


Figure 19: *(No) Jonathan is marrying Amanda.*

5 Conclusion and future directions

The present model of SgE intonational phonology argues that SgE is a head- and edge-prominence marking language, similar to languages such as Bengali and Georgian. It is proposed that SgE possesses a prosodic structure comprising of three tonally-marked phrases above the word.

Stress is lexically-specified and content words (and sometimes function words) seem to receive a pitch accent realized as L*. Accentual Phrases typically contain one content word and any preceding function words. As we saw, however, some function words like pronouns seem to also be capable of forming their own AP in the right context. APs are marked tonally by an aL initially and Ha finally. A number of APs can make up a single Intermediate Phrase which are tonally marked by either a L- or H-. Finally, Intonational Phrases represent the largest tonally-marked prosodic unit and is marked at the right-edge by a L% or H%.

A number of questions remain to be answered. The first is the relationship between tones of different prosodic units. More specifically, it is unclear whether or not tones of a higher prosodic unit override those of a lower one or not. A second question is whether or not an L* truly optional and is necessary in addition to aL. We have also seen variation in longer words

where there is an additional rise during the word.

The study of the intonation of SgE is instructive beyond the immediate descriptive goal. One future avenue of research would be cross-dialectal comparisons of intonation amongst different varieties of English. Furthermore, because of the history of its genesis, SgE provides an interesting opportunity to study the results of language contact on a language's intonation system. Moreover, it has been noted elsewhere (Lim & Tan 2001) that the SgE speakers of different ethnicities cue prominence in different ways. It is plausible then that they also differ in their intonational systems. The present study only recorded Chinese SgE speakers. A further avenue of research would be to analyze data from SgE speakers of other ethnicities. Finally, the SgE lexicon contains a number of question and discourse particles that have been argued to have lexically-specified tone (see Lim 2004 for a summary). How these would fit into the present intonational model is an open question.

This paper has presented the first phonological model of SgE intonation. Of course, many questions remain and further investigation is required to refine and modify the present model.

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