

Tone assignment in Hong Kong English

WEE, Lian Hee

Published in:
Language

DOI:
[10.1353/lan.2016.0039](https://doi.org/10.1353/lan.2016.0039)

Published: 01/06/2016

[Link to publication](#)

Citation for published version (APA):
WEE, L. H. (2016). Tone assignment in Hong Kong English. *Language*, 92(2), e67-e87.
<https://doi.org/10.1353/lan.2016.0039>

General rights

Copyright and intellectual property rights for the publications made accessible in HKBU Scholars are retained by the authors and/or other copyright owners. In addition to the restrictions prescribed by the Copyright Ordinance of Hong Kong, all users and readers must also observe the following terms of use:

- Users may download and print one copy of any publication from HKBU Scholars for the purpose of private study or research
- Users cannot further distribute the material or use it for any profit-making activity or commercial gain
- To share publications in HKBU Scholars with others, users are welcome to freely distribute the permanent publication URLs

Tone Assignment in Hong Kong English*

Lian-Hee Wee

Hong Kong Baptist University

lianhee@hkbu.edu.hk

23 Jan 2016

Abstract

This paper provides an argument for Hong Kong English being a tonal language and informs the growing literature on word- and phrase-level prosody interactions. By teasing apart tonal effects that come from intonation and the word boundary, a clear picture emerges that H tones are assigned in all combinations to HKE di- and tri-syllabic words. Tone spreading and blocking can also be seen in HKE across words, but syllables specified for H lexically never give up their tones. Complexity in HKE tone patterns arise when the H tones interact with boundary tones such as the declarative final L% and the word initial M.

Key words:

tone, boundary, intonation, Hong Kong, English

1. Introduction

The English spoken in Hong Kong (henceforth HKE) is a contact variety first noted in 17th century Macau (Bolton 2003:139) when the English traded with China through the waters near the Yue (Cantonese)-speaking areas. This variety of English then found nurturing soil in Hong Kong, annexed to the British via the Convention of Chuanpi (1840), and later the Treaty of Nanjing (1842), both documents under the custody of the Republic of China government, now in Taiwan.

The tonal properties of HKE words were first articulated in Luke (2000) and subsequently studied in Wee (2008), Cheung (2009) and Gussenhoven (2012, 2014). With reference to these earlier works, and based on first-hand data collected, this paper demonstrates that (i) at the word level, high tones are lexically assigned to particular syllables of Hong Kong English words; (ii) word-initial boundaries are marked by mid-tones M; (iii) utterance right-edge boundaries are marked by a low tone L%; and (iv) the tones of remaining syllables are derived by spreading or interpolation depending on their positions. The first two points have hitherto not been explicitly articulated and serve to complement extant literature in accounting for data that have slipped through the cracks. The third point supports Cheung (2009), contra Gussenhoven (2012), showing how a boundary tone understanding of L% provides not only a more comprehensive but also a simpler account of the data. The final point provides a handle on an otherwise slippery aspect of the HKE pitch/tone patterns.

* The research is supported by Hong Kong Baptist University FRG2/10-11/074, FRG2/11-12/135 and by Hong Kong Research Grant Council GRF250712. Thanks to consultants, eight (balanced for gender) of whom provided recordings used for obtaining the normalized F0 profiles, three others for further recordings that I use for cross-checking purposes, and about 180 local students with whom I checked for judgments of HKE pronunciations; all have to remain unnamed to preserve anonymity. Thanks also to reviewers, and also Mingxing Li and Yuting Li whose comments made for many improvements. Winnie H.Y. Cheung has been an important influence in this paper, as has been Diana Archangeli who provided extensive comments while grounded by Typhoon Usagi, and I am immensely grateful to them. Special thanks to Matt Gordon who did editorial magic to this piece. All faults mine.

Together, the HKE facts contribute a particularly instructive example on word-and phrase-level prosody interactions, echoing Gordon (2014).

Before moving on, a few words of caution in studying HKE as a variety of English are in order. Research on any variety of English is often confronted with the difficulty of explaining what that variety is and how one can understand the variations in that given variety. In relatively new Englishes such as HKE, even the phonetic description of the data needs some attention.

Whether or not there is such a variety as Hong Kong English remains a matter of some debate (Luke and Richard 1982; Tay 1991; and Johnson 1994), although recent works have argued in favor of its existence (Bolton and Shirley 2000; Chan 2000; Bolton 2002, 2003; and Pang 2003). For present purposes, suffice it to note that the English as spoken by Hong Kongers has such a strong and distinct character that it has allowed exploitation by comedians to create humor. Anyone familiar with Hong Kong will be able to identify Hong Kong English.

Thus, at least from the phonological point of view, the English spoken in Hong Kong may be justifiably treated as a variety in its own right. This approach is taken notably by Hung (2000, 2005) though tones are not mentioned in his studies. This paper uses the term Hong Kong English (HKE) as reflective of its phonological distinctness and is non-committal on whether HKE is a full variety of English on a par with American, Indian, Singapore or Philippine Englishes.¹

This paper is structured as follows: section 2 presents the methodology employed in the present study, while section 3 lays out the basic tonal description of HKE. Section 4 is the meat of this paper and provides the main analysis to the HKE tonal data. Section 5 then takes a look back at the earlier works that have served as the foundation for the present one, explaining the areas that might have once obfuscated a clearer articulation of HKE tonal patterns. With the analysis in place, section 6 takes a side glance at Cantonese and British English to see how and if they might have related to the HKE tone patterns. The section also includes a brief look at Singapore English tone patterns which appear uncannily like HKE at first blush and might be amenable to a stress analysis as well. Section 7 offers a conclusion.

2. Methodology

While the tones of HKE are readily perceivable, the impressionistic description of tone on which this paper is based was corroborated through an acoustic study. Using Praat (ver. 5.3.23, Boersma and Weenink 2012), recordings were collected at a sampling frequency of 22,050Hz from four males and four females aged 18-20 who are from middle income families and who use English fairly regularly in their daily lives (mostly at the university). The patterns reported here were consistent across the eight speakers whose data was consulted for this paper. Recordings were also presented anonymously to at least two other native Hong Kongers to judge if they sound typical of Hong Kong spoken English. For the recordings, each word was produced three times as a single utterance to obtain utterance-initial, medial and final F₀ patterns. A prompt “what you wanted to say was ...” was used to cue subjects to utter each triplet given as a single utterance.

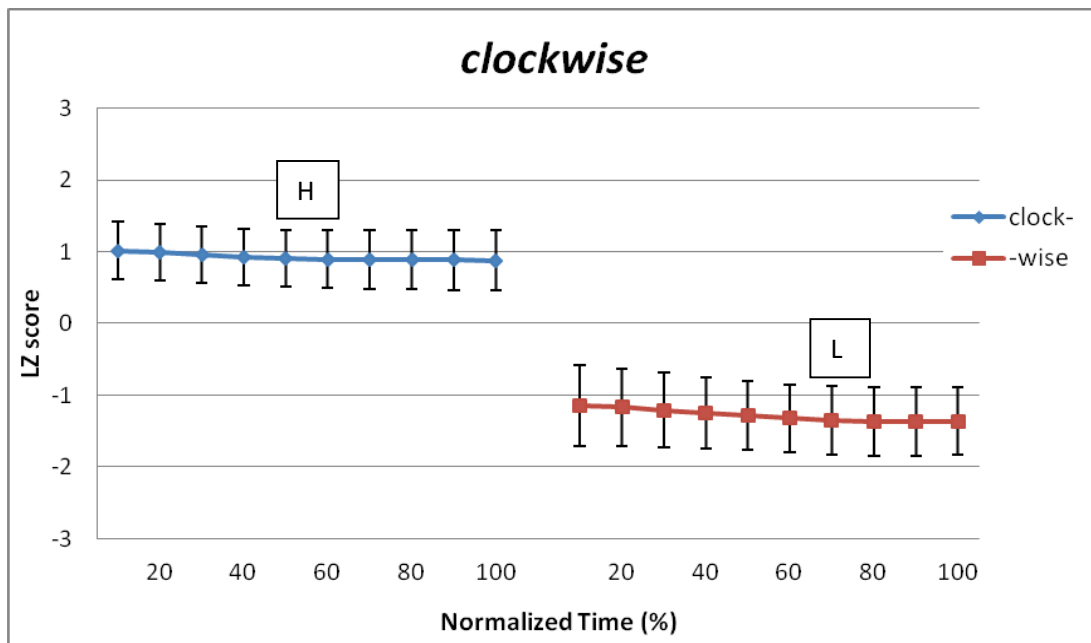
¹ Even when one concentrates only on phonological issues, HKE has internal variation. This is hardly surprising since such variation is found in any other language. However, to the extent that we have been able to determine, tonal variations do not go beyond the patterns presented in this paper.

Using Xu’s (2012) TimeNormalizedF0 Praat script, F0 frequencies were taken at every 10% interval for the rhyme of every syllable and manually checked against broadband spectrograms in Praat. This procedure generated mean F0 frequencies across speakers (Mean Time-normalized F0) at each 10% interval point. F0 values in Hertz were converted into logarithmic z-scores (LZ) using the formula $LZ = (F0_i - M)/SD$, where $F0_i$ is the sampling point, M is the mean F0 of all sampling points and SD the standard deviation around M, all in \log_{10} (following Zhu 1999, used also in Ishihara 2000). This allows for the different vocal ranges of the speakers to be compared on the same scale. In all the cases presented in this paper, the tone profiles of the words were created by averaging the LZ for each of the interval points across speakers with the standard deviation provided.

3. Basic Descriptions of HKE tones

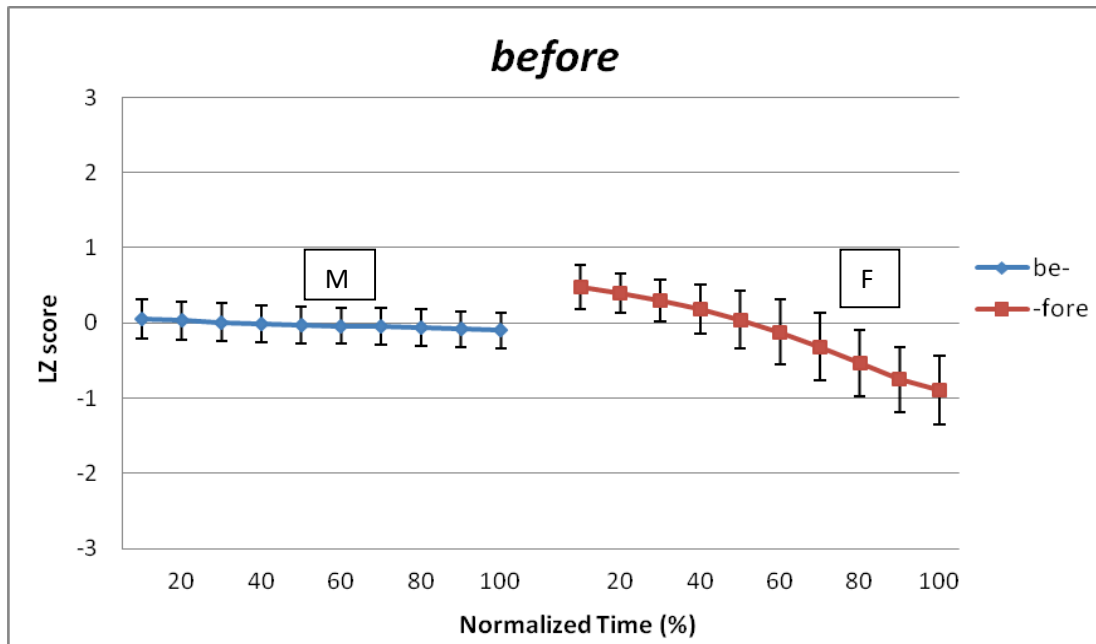
One aspect on which all previous studies of tone in HKE agree is that there are H(igh) tones, M(id) tones and L(ow) tones, as exemplified in words like *clockwise* and *before* in (1a,b). In addition to these, it can also be shown that falling tone contours are also found in HKE, exemplified in (1b) and also monosyllabic words like *plan* in (1c).

(1) a. F0 profile of *clockwise*²

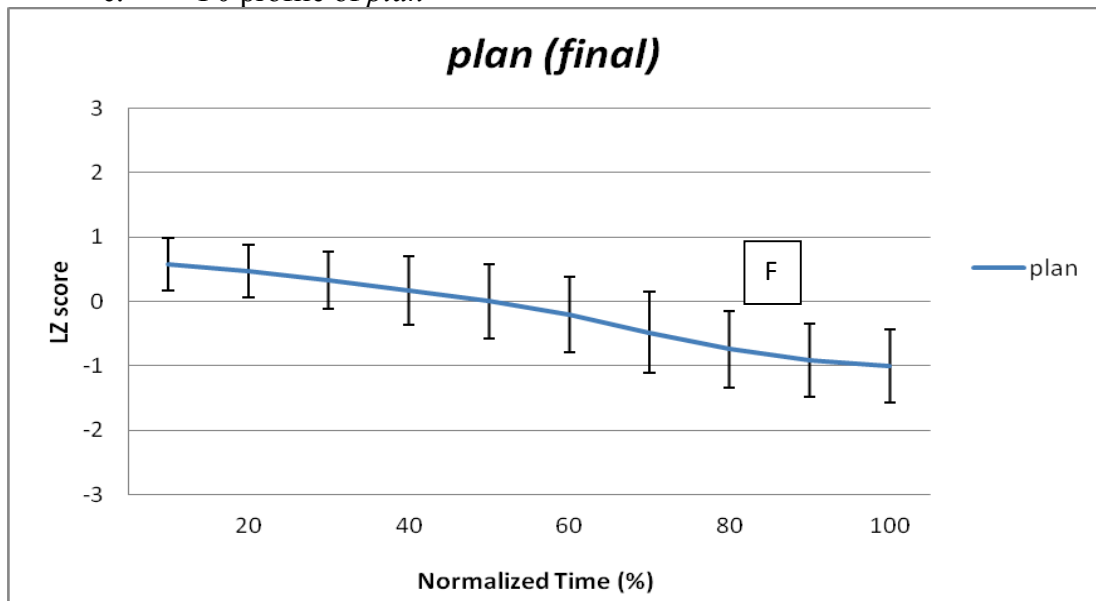


² The apparent large pitch gaps across syllables (and elsewhere) are due to voiceless segments.

b. F0 profile of *before*



c. F0 profile of *plan*

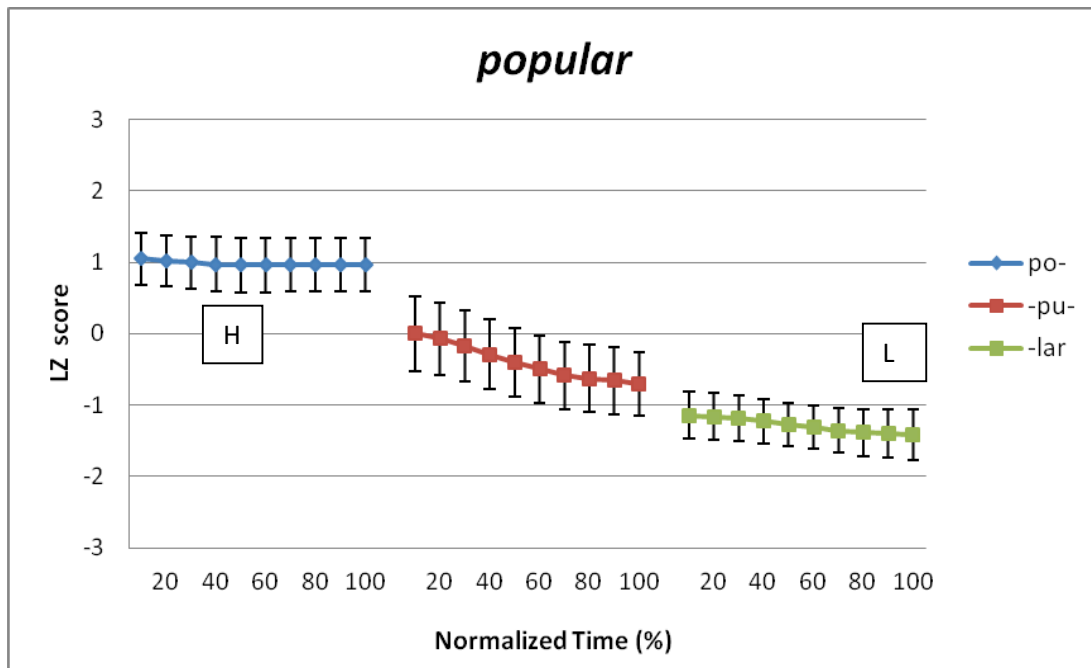


As the figure shows, the H, M and L tones are quite clearly distinct, as is the F(alling) tone in (1b) and (1c). The F tone was not reported in Luke (2000) and hence not taken up in Gussenhoven (2012) which based its analysis on Luke’s data. Luke (2000) reported only H tones for monosyllabic words, though all his examples were words ending with obstruents which would have masked the final half of a falling contour. In HKE, all final obstruents are voiceless (Hung 2000); distinctions between words like *bid* and *bit* are made by aspirating the final segment, a strategy different from British or American varieties where the vowel [ɪ] might lengthen slightly to cue voicing of the final obstruent. The falling tone however, was reported in Wee (2008) and Cheung (2009). We will return to the issue of the falling tone in section 4.3 and

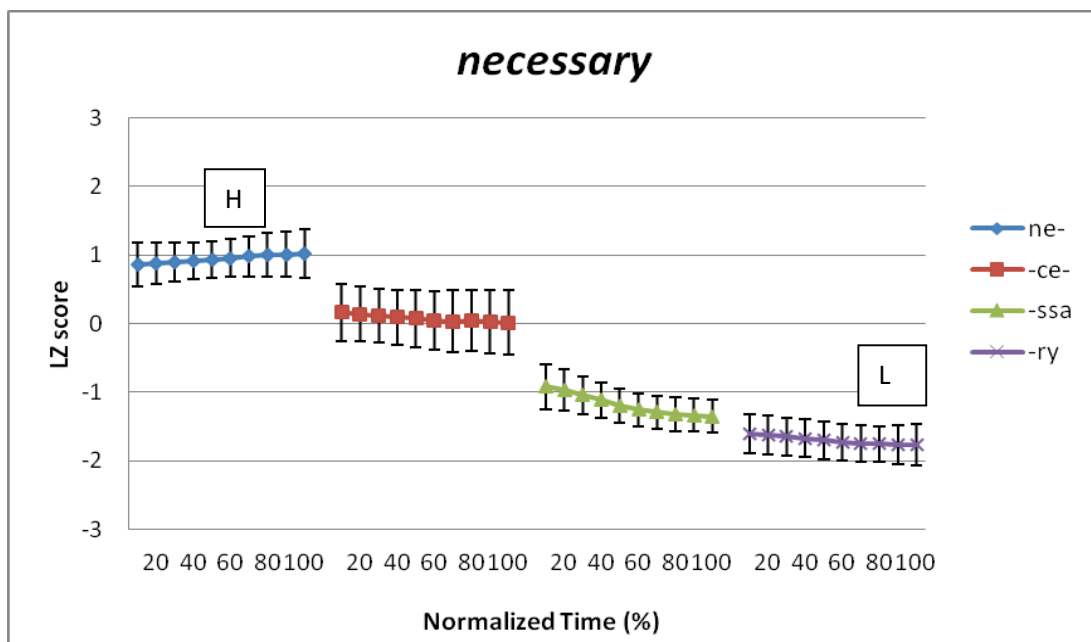
section 5.1. Suffice for now that the labels H, M, L are uncontroversial in the description of HKE pitch patterns, to which one may add F as shown in (1b, c).

There is one other issue that needs to be sorted out before a coherent description for the tone in HKE words is possible. There are syllables that show gradual pitch declinations suggestive of interpolation from H towards a final L, as shown in (2).

(2) a. F0 profile of *popular*



b. F0 profile of *necessary*



The examples in (2a) and (2b) exemplify that post-H non-final syllables have pitch values that are derived by interpolating from H to a final L, a process found similar to one observed in the interpolation from lexical H to boundary L% in Japanese (Pierrehumbert and Beckman 1988:37-46). We will return to the status of L and explain that it is a boundary tone L% in section 4.3 and section 5.1. For now, we interpret figures like (2a) and (2b) as evidence for an analysis in which post-H non-final syllables receive no tone at the phonological level (3).

- (3) Atonal syllables in HKE
 Post-H syllables in HKE are toneless (tonelessness henceforth indicated as “o”).

Without committing to whether or not the H, M, L and F tones are phonological, the tone patterns of HKE words are exhaustively listed in (4) to (6) below, accompanied by tables indicating the unattested surface combinations.

- (4) Monosyllabic HKE words: F type only

- i. plan
- ii. pinch
- iii. tree

- (5) Disyllabic HKE words

- | | | |
|---------------|--------------|-------------|
| a. H-L type | b. H-F type | c. M-F type |
| i. apple | i. sometimes | i. create |
| ii. clockwise | ii. outsell | ii. giraffe |
| iii. greeted | iii. inborn | iii. before |

1 st σ \ 2 nd σ	-H	-M	-L	-F	o
H-	*	*	✓ (5a)	✓ (5b)	*
M-	*	*	*	✓ (5c)	*
L-	*	*	*	*	*
F-	*	*	*	*	*
o-	*	*	*	*	*

- (6) Trisyllabic HKE words

- | | |
|-----------------|------------------|
| a. H-o-L type | b. H-M-F type |
| i. yesterday | i. runaway |
| ii. beautiful | ii. roundabout |
| iii. popular | iii. go-between |
| c. H-H-L type | d. H-H-F type |
| i. kidnapper | i. undersold |
| ii. handwriting | ii. overwrite |
| iii. newspaper | iii. kangaroo |
| e. M-H-L type | f. M-H-F type |
| i. prohibit | i. about-turn |
| ii. emergence | ii. Repulse Bay |
| iii. erotic | iii. alarm clock |

- g. M-M-F type
 - i. introduce
 - ii. dislocate
 - iii. recommend

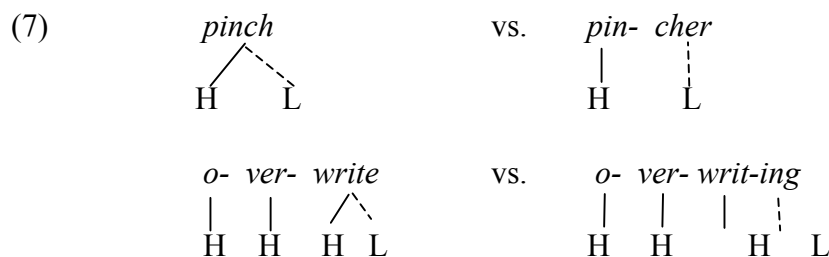
1 st & 2 nd σ \ final σ	-H	-M	-L	-F	-o
H-H-	*	*	✓ (6c)	✓ (6d)	*
H-M-	*	*	*	✓ (6b)	*
H-o-	*	*	✓ (6a)	*	*
H-F-	*	*	*	*	*
M-H-	*	*	✓ (6e)	✓ (6f)	*
M-M-	*	*	*	✓ (6g)	*
M-o-	*	*	*	*	*
M-F-	*	*	*	*	*
o-H-	*	*	*	*	*
o-M-	*	*	*	*	*
o-o-	*	*	*	*	*
o-F-	*	*	*	*	*

The question confronting any full fledged analysis of HKE tones is how to account for all the grey cells in (5) and (6), while generating all the attested sequences. Following Gussenhoven’s (2012:4) advice that “analyzing the tonal system of a language without taking the intonation into account can be risky [since] ... pitch phenomena may be assigned to lexical tones that belong to intonational tones”, the next section concentrates first on the H tone, followed by the M tone and then the L tone before subsequent sections piece them together.

4. Elements of the HKE Tone System

4.1 H TONE AS LEXICAL ASSIGNMENT

Assuming a compositional approach towards contour tones, the F tone can be construed as a H-L sequence. In HKE, this move is supported by the fact that F is only found in the final positions of examples like those given in (4-6) and has the same distribution of L. Also, when suffixes are added to F-toned words, the tone clearly splits into H and L. For example, *pinch* is F while *pincher* is H-L; *overwrite* is H-H-F while *overwriting* is H-H-H-L.



If the L and M tones are removed from the examples so that these syllables are now notated as toneless “o” for convenience, the H tone patterns of HKE can now be more clearly discerned as seen in (8).

- (8) H in HKE words
- a. Monosyllabic words: H (cf. (4))
 - b. Disyllabic words: H-o (cf. (5a)), H-H (cf. (5b)), o-H (cf. (5c))
 - c. Trisyllabic words: H-o-o (cf. (6a)), H-o-H (cf. (6b)),
H-H-o (cf. (6c)), H-H-H (cf. (6d)),
o-H-o (cf. (6e)), o-H-H (cf. (6f)),
o-o-H (cf. (6g))

An interesting feature of the list in (8) is that all words apparently must have at least one H tone, a requirement stated as (9), which applies to content but not function words as will be seen in section 4.5.

- (9) Obligatory H
A HKE word must contain at least one H.

From (9), one can see that all possible combinations of H tone assignments are attested in (8). In monosyllabic words, there is only one possibility. In disyllabic words, H is assigned to the first, second or both syllables. In trisyllabic words, H is assigned to any one of the three syllables, two of the three, or to all, giving a total of seven possibilities. The completeness of all tone assignment possibilities suggests that H is lexically assigned and probably is part of the lexical stipulation of each given word.

The observation that H-assignment covers all possible combinations of di- and trisyllabic sequences suggests that contra Gussenhoven (2012, 2014) HKE is a tone language that is different from both a prototypical “stress” language like American or British English with a single syllable that is more prominent than others or a “pitch accent” language like Japanese with a limit of one pitch accent per word (see Hyman 2006, 2009 on the typology of prominence systems). A more reasonable approach would be to assume that H tones in HKE are lexical in nature. Further evidence for the lexical nature of tone in HKE comes from Lo’s (2015) experiment demonstrating that HKE speakers are unable to recognize words if the H tone is relocated to other positions.

4.2 M AS WORD-INITIAL BOUNDARY

Unlike H, M is not lexically assigned, even though it can be demonstrated to be a tone that operates at the lexical level. Looking back at (5) and (6), one can see that the distribution of the M tone is restricted, occurring only word-initially (i) in monomorphemic words like those in (5c, 6e-g) and in compounds (ii) like those in (6b), which have the morphological structure in (10).

- (10) a. [word [word *run*] [word *away*]]
b. [word [word *round*] [word *about*]]
c. [word [word *go*] [word *between*]]

From (10), one can conclude that M must be attributed to the word level. Realizing that M is associated with the word level offers a natural explanation for the other M-initial tone types in HKE (i.e. (5c), (6b, e-g)). The question is if it is wise to treat M as a lexical tone underlyingly specified for some words. Such an approach however is undermined by the regularity in the distribution of M: M is always word-initial. A more reasonable approach would be to treat M as a word-initial³ boundary tone, to be assigned to all words unless that syllable is already underlyingly specified for H.

Thus M and H are different in that H is really part of the lexical tone and M is derivable by rule, even though both are projected at the word-level. There is some phonetic evidence in favor of treating H and M differently, which comes from a comparative study with Cantonese to be presented in section 6.

4.3 L AS UTTERANCE BOUNDARY

The issue of the L tone is the most complicated feature of the tone system of HKE. Cheung (2009) believes that it is an utterance boundary tone, a view not shared by Gussenhoven (2012, 2014). This paper, in agreement with Cheung (2009), believes that the L tone is a boundary tone and should be represented as L% for the following reasons. Firstly, the L occurs only in the ultima as seen in the list of words given in (4) to (6). Secondly, the distribution of L and F are the same, i.e. F also occurs in the ultima. If L is really an utterance final L%, F can be easily treated as a concatenation of H and L% on the same syllable, as was done in section 4.1. Finally, syllables with L tone lose that L when followed by an other word, as do syllables with F tone. In both cases, the word-final syllable that originally carried the L in isolation receives a H tone instead, displacing the L tone to the end of the utterance, as in (11).

(11)	Displacement of L to final positions	
a.	proudly	HL
b.	chosen	HL
c.	kangaroo	HHF
d.	proudly chosen	HH + HL
e.	chosen proudly	HH + HL
f.	proudly chosen kangaroo	HH+HH+HHF
g.	kangaroo chosen proudly	HHH+HH+HL
h.	student chosen proudly	HH+HH+HL

In (11a, b), *proudly* and *chosen* both have the tone pattern H-L. Note how the concatenations of these words in (11d-h) into single utterances push L rightwards to the edge, even for F-final words like *kangaroo*.

The most straightforward treatment for the L and F tones in HKE would be to recognize the utterance-final boundary tone as L% which may combine with final H to form F. Utterance boundary tones are not novel and have been observed in Japanese (Pierrehumbert and Beckman 1988, but see Duanmu 2008 for an excellent update), Mexican Spanish (Prieto, Shih and Nibert 1996), Yoruba (Laniran 1992),

³ Given the behavior of compounds, it might be more accurate to think of the domain of M as the root, but not root-initial. M will surface on the prefixes such as *en-* in *enrich*, or *non-* in *non-linear*. For current purposes, what matters is firstly that M and L operate on two different prosodic levels and secondly that M is not a lexical specification unlike H.

Kipare (Herman 1996) and Southern German (Truckenbrodt 2004), among many other languages. In all these cases the declarative utterance boundary tone is L%.

With the basics of H, M and L% in place, one can now deal with the patterns of tone alternation in HKE.

4.4 TONE SPREADING

In (11) above, we saw how both F and L alternate with H. In the case of F, the analysis advanced in section 4.3 was that the alternating syllable starts with a H tone but surfaces as F when combined with the utterance final L%. However, that does not explain how words in (11a) like *proudly* with the tone sequence HL would surface as HH in (11d).

Recalling (2a, b), we have seen how H transitions to L% across intervening toneless syllables. As it turns out, H tones can spread rightwards, leading to neutralizations of otherwise different inputs tonal sequences in longer words strings, a phenomenon noted also in Luke (2000), Cheung (2009) and Gussenhoven (2012).

- (12) a. /H-o/ and /H-H/ neutralizes to [H-H]
greeted /H-o/ ~ *greeted* [H-H] *him* [H]
outsell /H-H/ ~ *outsell* [H-H] *him* [H]
- b. /M-H/ alternates between [M-F] and [M-H]
before [M-F] ~ *before* [M-H] *him* [H]
- c. /H-o-o/, /H-H-o/ and /H-H-H/ neutralize to [H-H-H]
beautiful /H-o-o/ ~ *beautiful* [H-H-H] *girl* [H]
newspaper /H-H-o/ ~ *newspaper* [H-H-H] *vendor* [H-o]
overwrite /H-H-H/ ~ *overwrite* [H-H-H] *this* [H]
- d. /M-H-o/ and /M-H-H/ neutralize to [M-H-H]
prohibit /M-H-o/ ~ *prohibit* [M-H-H] *alcohol* [H-o-o]
alarm clock /M-H-H/ ~ *alarm clock* [M-H-H] *dealer* [H-o]
- e. /H-M-H/ alternates between [H-M-F] and [H-M-H]
runaway [H-M-F] ~ *runaway* [H-M-H] *bride* [H]
- f. /M-M-H/ alternates between [M-M-F] and [M-M-H]
recommend [M-M-F] ~ *recommend* [M-M-H] *him* [H]

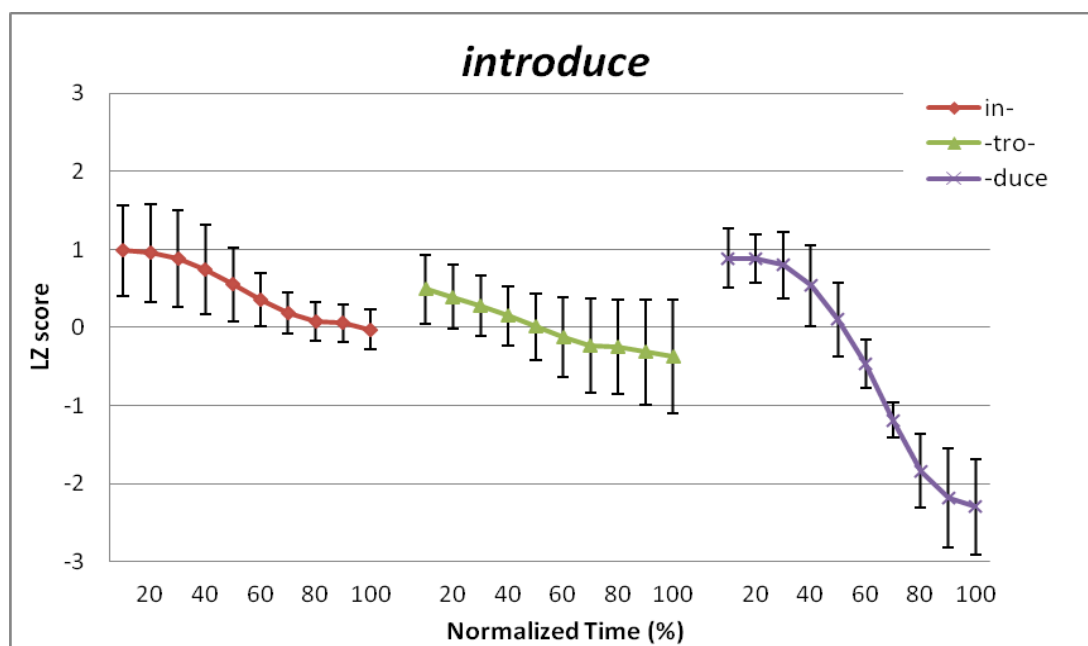
As mentioned, the alternations between word-final H and F are not surprising, since that such an alternation could be derived simply by concatenation of H+L%. The interesting observation in (12) is the alternation between toneless syllables (which get transitional tones) and H. Crucially, a H tone only surfaces if there is another non-boundary tone to its right; when there is no further tone to the right, as in utterance-final position, a syllable not carrying an underlying H remains toneless. At first blush the data in (12) thus suggest that the toneless syllables get H by interpolation between the surrounding H tones. This is essentially the position taken by Cheung (2009). This approach will not work, however, because of data like (13).

- (13) a. overhead + projector → overhead projector
 H-o-o M-H-o H-H-H M-H-L%
- b. beautiful + before → beautiful before
 H-o-o M-H H-H-H M-HL%
- c. glory + newspaper → glory newspaper
 H-o H-H-o H-H H-H-L%

In (13), toneless syllables receive H even when the following tone is M, so the source must come from the left and is not attributable to pitch plateauing of syllables sandwiched by Hs. The examples in (13a) and (13b) show that M blocks the spread of H.

If one also reconsiders (6g), M also appears to be capable of spreading rightward. HKE trisyllabic words of the M-M-H type like *introduce* and *comprehend* indicate that both the initial and the medial M have very similar F0 profiles, shown in (14).

(14) F0 profile of *introduce*



The pitch trace in (14) is taken from utterance-final position. In other positions, profiles of both initial and penultimate M are likewise similar. The pitch profile suggests that the tone of the medial syllable is indeed an M and not a transitory tone from the initial M to the following H. A simple way to capture this is to assume that M is associated to all pre-H syllables in HKE. Thus, both syllables *in-* and *-tro-* would be associated to a single M tone; the same applies to *com-* and *-pre-* in *comprehend*. There is some support for this multiple-linking of M. As it turns out, both *introduce* and *comprehend* have the following tonal variants M-M-H and H-H-H, but never *M-H-H or *H-M-H. To summarize, the patterns of HKE tone can be captured by the following principles in (15).

(15) Principles of Tones in HKE

Syllables in HKE are underlyingly specified for H

Associate M to any word-initial syllable that is not underlyingly H.

Associate L% to utterance final position.

H-spread: Except for the H nearest the utterance-final boundary, spread H rightwards to an adjacent toneless syllable

M-spread: Spread M rightwards to all pre-H syllables

Except for the utterance final syllable, HKE bans contour tones.

If one looks at (15) carefully, F tone is only licensed in utterance-final position and all other syllables receive either M or H tones but not a contour tone through spreading. Syllables between the final H and the L% remain unassigned for tone and hence receive transitory pitch profiles as a result of interpolation. Another important feature of both H and M tone spreading is the requirement that there be another (non-boundary) tone to the right of the spreading tone. This condition ensures that syllables following the rightmost H or M in an utterance remain toneless and receive their surface F₀ values through interpolation between the rightmost lexical tone to the final boundary tone. The principles in (15) correctly predict all the tone patterns in HKE.

4.5 COMPLEMENTARITY BUT NON-IDENTITY OF M AND L

In section 4.2 it was suggested that M is a word-initial boundary tone. Such a position, if tenable, should address two residual issues. Firstly, an explanation is needed as to why M would not concatenate with H-initial words to produce a rising tone. Following Zhang (2001), contour tones are unlikely in non-final positions because these syllables do not undergo final lengthening. Therefore, unless the non-final syllable is for some reason lengthened, there is a principled reason as to why all non-final syllables do not carry contour tones in HKE. This position is supported in HKE by the observation that only utterance-final syllables may bear contour tones (i.e. F, via concatenation H+L%).

Secondly, M and L% appear complementary, which in turn leads one to query whether M could be an utterance-level boundary tone parallel to L% but positioned at the left edge of an utterance rather than the right edge. It is, in fact, easy to demonstrate that M is not an utterance boundary marker like L% since it surfaces utterance-medially at the beginning of words.

To demonstrate that L% and M are associated with different levels of prosodic constituents, an introduction to some properties of function words in HKE is in order. It is worth noting that the tones of HKE function words are different from the lexical ones discussed in the preceding sections. I shall not attempt to offer a full treatment of HKE function words in this paper, but will describe their tone patterns in hope that they shed light on the word vs. utterance distinction. This is done in (16) complemented by a table summarizing the descriptions.

- (16) HKE tones on function words
- i. Pronouns that serve as syntactic arguments (e.g. *him, her, he, she, it, they, them, theirs, mine, hers*)⁴ behave like monosyllabic lexical words, i.e. they are assigned H and can become F when concatenated with boundary L%.
 - ii. Demonstratives (e.g. *these, those, that, this*), even when used as determiners, behave like monosyllabic lexical words, i.e. they are assigned H and can become F when concatenated with boundary L%.
 - iii. Pronouns that serve as possessors (e.g. *his X, my X, her X*) and determiners (e.g. *a, an, the*) receive M tones.⁵
 - iv. Modals (e.g. *may, might, can, could, shall, should, must, will, would*, also auxiliaries like *do* and *have*) receive M tones even in isolation.
 - v. Negator *not* receives H and behaves much like other monosyllabic lexical words.
 - vi. Negation clitic *n't* assigns H to its host, overriding the H assignment stated in (v). The clitic surfaces as H utterance medially, but L% utterance-finally.⁶
 - vii. Monosyllabic prepositions⁷ (e.g. *in, on, with*) receive M in all instances, except *through* whose tone patterns behave like that of a lexical word.
 - viii. Disyllabic prepositions (e.g. *under, between, across, beside, along, against*) behave like disyllabic lexical words.

	H	M	L%
Pronouns	✓		
demonstratives	✓		
Possessors		✓	
Modals		✓	
not	✓		
n't	Assigns H to stem		
prepositions (σ)		✓	
prepositions (σσ)	oH/Ho		

The table in (16) shows that none of the function words are L% per se while several are M, thus further substantiating section 4's claim that M is a word-level tone in contrast to L%, which is an utterance boundary tone. Certain classes of function words differ, however, from content words in lacking a lexical H tone and instead receiving the default word boundary tone M.⁸

Further evidence for the utterance-level status of L% is found in multi-word sentences in which a L% is limited to utterance-final position unlike M and H, which may occur consecutively, as shown in (17).

⁴ This includes *his* as the masculine version of *hers*.

⁵ Uttering these words in isolation is hard to imagine, but this can happen if the speaker is truncating from a fuller phrase like *his cat*. In such cases, the tone is still M.

⁶ As to how the *n't* gets a H tone, a number of guesses are possible. My hypothesis is that it is stipulated that H must be associated to its host, thus triggering delinking from the clitic, which surfaces as L%. As a light syllable lacking a vowel it is too short to accommodate F.

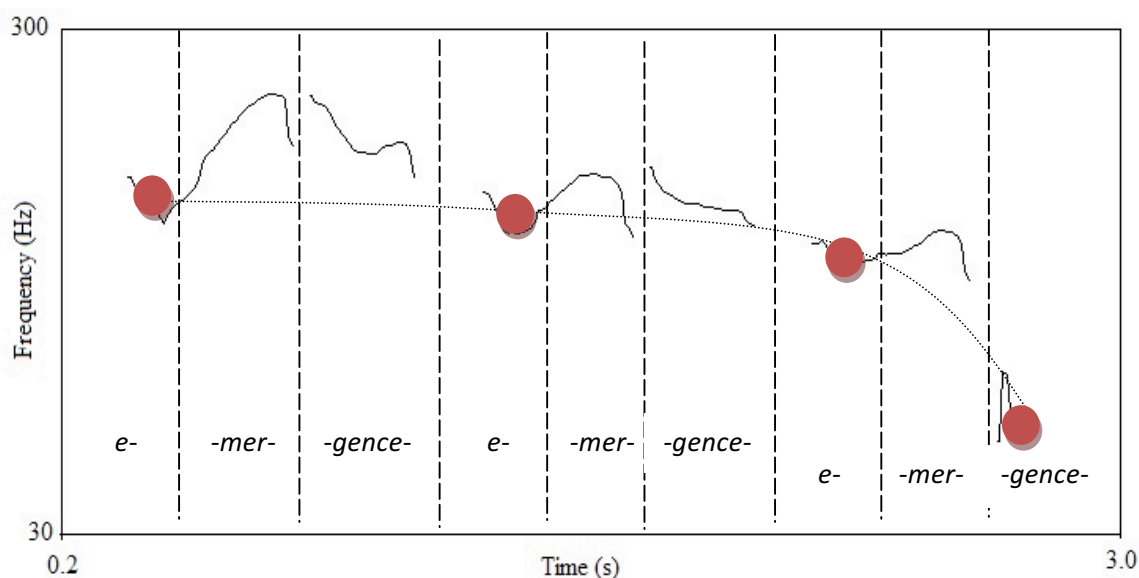
⁷ However, when ending a sentence, monosyllabic prepositions get F tones, behaving like monosyllabic words.

⁸ I owe this beautiful argument to Diana Archangeli, who made this clear to me by suggesting that the information be laid out in a table.

- (17) a. *The situation looks better*
M H H H H H H L%⁹
- b. *John is in the house.*
H M M M H-L%

There is one final piece of evidence showing that M and L are not the same. This is to be found in the words like *emergence* (o-H-o type) uttered thrice in a single breath. With *emergence*, we can plot the downtrend of the M syllable *e-* and compare that with *-gence*. If indeed the fall is gradual from the first three M syllables to the final *-gence*, then it is possible that L% is the effect of downtrend. Conversely, if there is a sharp fall towards *-gence*, the claim that L% is part of downtrend with M is untenable.

- (18) *Emergence* uttered thrice as in a single breath (sample from female, age 20)



In (18), vertical dotted lines present approximate syllable boundaries. Across the graph, a finely dotted line traces the projection of the tones for the three M syllables corresponding to *e-* in *emergence* before ending in the final syllable *-gence*. As explained in earlier sections, the *-gence* in initial and medial articulations will get a tone that is interpolated from the H of *-mer-*¹⁰ to the M of *e-* (which is exactly as shown here). The final *-gence* shows a very sharp drop (so steep, it ended up as creaky voice here and also for many of the informants), indicating that this is not part of the expected projection if we followed the three preceding M tones. If indeed M and L% are the same and that the L% is really just downtrend from M, (18) is certainly not what is expected.

Since M can be derived by rule, the tone rules of HKE can be updated again as to reflect another potential source of surface tone for syllables not lexically marked for tone. Toneless syllables thus receive M in word-initial position, M or H through

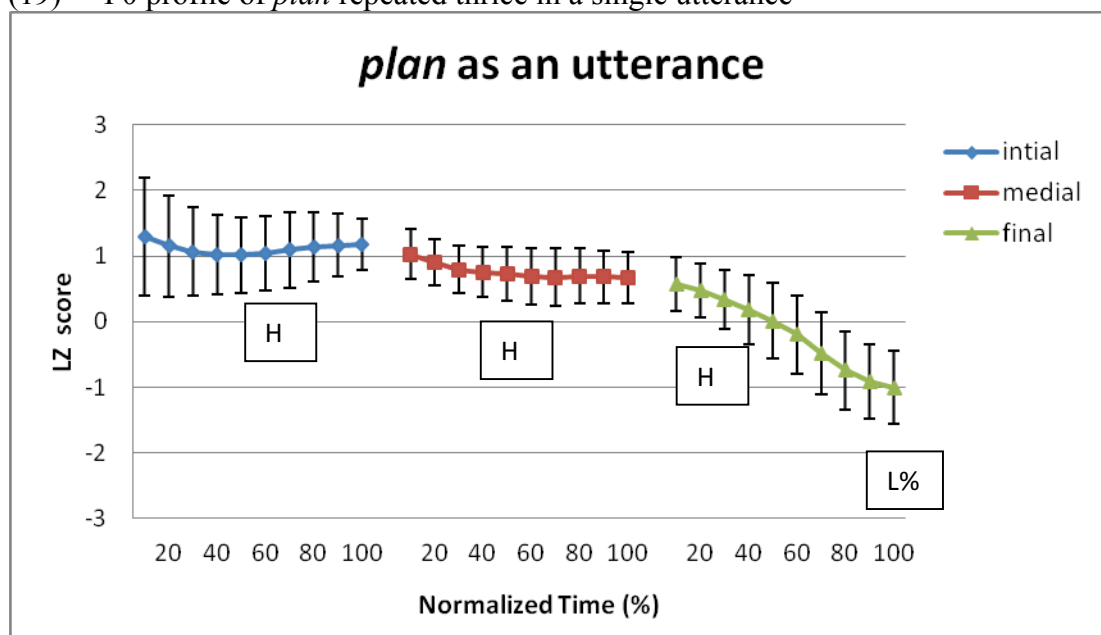
⁹ H spreads, as discussed in section 4.4.

¹⁰ The pitch-drop at the end of *-mer-* which likely due to the affricate onset of *-gence*, a phonetic effect that does not threaten the interpolation story.

rightward tone spreading in utterance-non-final words, or L% at an utterance boundary. Syllables not receiving tone from one of these sources (or from lexical marking of tone) have a surface tone pattern reflecting interpolation from a preceding tone to a following L%.

Before closing the section, there is one more property of HKE tone that can be observed in examples like those in (17) containing strings of consecutive H or M tones. In HKE, a sequence of H or M tones is subject to downdrift such that a H tone following another H tone or a M tone following another M tone is uttered with slightly lower F0 than the preceding one in the sequence. This effect is exemplified in (19), which contains three tokens of a single word produced as a single utterance.

(19) F0 profile of *plan* repeated thrice in a single utterance



5. Earlier Studies of Hong Kong English Tone

The first report on the tonal patterns of HKE came from Luke (2000) and that dataset formed the basis for Gussenhoven's (2012) analysis. Between that span of a dozen years, the one major work is Cheung (2009), which revealed a number of inadequacies in Luke's work, particularly in separating word-level tone from phrase-level intonation, as well as the interpolating character of pitch profiles of syllables between H and L% (Gordon 2014). This section takes a look at these earlier works and their relation to the present paper.

5.1 ON THE NATURE OF THE L TONE IN HKE

By and large, the data descriptions of all three authors are similar, but for one major difference: L. Firstly, in Luke's report, H is assigned to stressed syllables so that syllables after the final "stress" receive L tones (more on stress later in section 5.2). Thus, a word like *holiday* in Luke's notation is H-L-L (which interestingly is incongruent with the pitch tracks provided in his paper's appendix) and one can figure that *interestingly* will have L tones starting from the antepenult. As we have seen in

(2), this claim is simply not supported by acoustic analysis, which is more consistent with an analysis positing a final L% preceded by syllables that have a transitory pitch from a preceding H (or M). The position adopted in this paper is in agreement with Cheung (2009), whose set of pitch tracks also led her to disagree with Luke in this aspect.

Secondly, still related to L, Luke reports no F tones at all and a H tone in all monosyllabic words. All his examples, however, are words ending with obstruents and since obstruents are systematically voiceless in HKE, the final half of the falling contour, if there were one, would have been obfuscated. The absence of F is supported by Gussenhoven (2012), who provided *Chinese* and *tea* as examples where the final syllables are H rather than F. Though *Chinese* has a final obstruent [s], *tea* is arguably more interesting in that there is no final obstruent to mask the F. On this ground, Gussenhoven (2012) argues that the L is lexically assigned.¹¹ Gussenhoven's argument is that if *tea* is not F, then it follows that L cannot be a boundary tone.

To tighten his case, Gussenhoven created recordings by having his subject (female, age 27) read single word visual stimuli that contained either no punctuation (declarative), a question mark (interrogative) or an exclamation mark (emphatic) in order to obtain readings for various kinds of intonation. His results were that *tea* sans punctuation was a flat H, *tea* with question mark was a high-rising contour and *tea* with the exclamation was HL. From these, Gussenhoven postulates that the declarative has no tone boundary \emptyset (though later in Gussenhoven (2014), he suggests that the declarative boundary may be \emptyset or L%), the interrogative has a H% and the emphatic declarative L%.

Though insightful, Gussenhoven's claims raise a couple of issues. Firstly, it is hard to determine under his analysis, whether L is a lexical tone or a boundary tone or if there are two different Ls. If there is a lexical tone L, its very restricted distribution to only utterance-final position needs to be explained. Secondly, one is left pondering why a period was not used in Gussenhoven's elicitation of the simple declarative. Unpunctuated words potentially lead to readings that a speaker might interpret as unfinished and hence may not be treated as utterance-final. My own recordings from eight subjects balanced for gender were consistently associated with F in monosyllables that were either open or closed by sonorants. Recall in section 2 that I took pains to ensure a declarative reading by using a frame and by having the speakers read each word thrice as a single utterance. In an attempt to square my data with Gussenhoven's, I replicated Gussenhoven's experiment by collecting single word readings for the words *tea*, which is itself a final syllable with a H tone, *apple* whose final syllable is not H and *yesterday* which has a toneless penult. The first two words also were found in Gussenhoven's experiment. These three words together allow the examination of the effects any intonation boundary tones may have on the various HKE lexical tone types. Two female native HKE speakers (age 21 and 29) were asked to provide recordings varying across seven punctuation types: (i) sans punctuation, (ii) ellipsis "...", (iii) comma ".", (iv) period ".", (v) exclamation "!", (vi) double exclamations "!!" and (vi) question "?". The results of the F0 profiles are schematized in (20).

¹¹ Gussenhoven (2014) actually claims that the L is assigned to syllables after the primary stress. The primary stress is the syllable that receives one of the H tones. One problem with this approach is that post-(primary stress) H non-final syllables are not L.

(20) Intonation productions

a. Without punctuation “X”

- i. tea ii. apple iii. yesterday

Variant 1



Variant 2



b. With ellipsis “X...”

- i. tea ii. apple iii. yesterday

Variant 1



Variant 2



c. With comma “X,”

- i. tea ii. apple iii. Yesterday

Variant 1



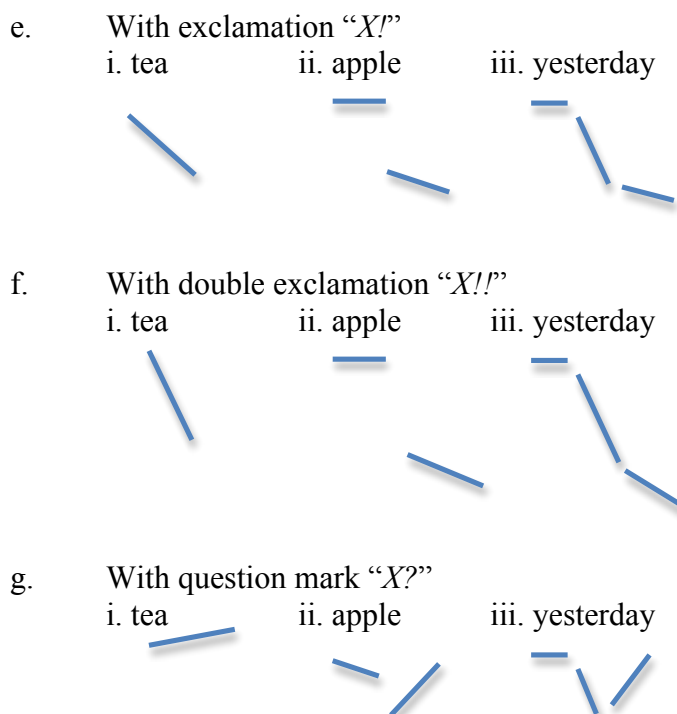
Variant 2



d. With period “X.”

- i. tea ii. apple iii. yesterday





Evidently, the profiles in (20d-g) are stable and consistent across speakers. In (20d-f), it can clearly be seen that degrees of emphatic intonation trigger exaggerated versions with respect to pitch interval and duration (also intensity, though not shown here) of the simple declarative that is indicated by the “period”.

The variation seen in (20a-c) is interesting and can also be observed across HKE speakers in more natural settings. To better understand if (20a-c) were indeed free variants, judgments were solicited from HKE speakers if they felt a particular recording could be paired with any of the three punctuations in (20a-c). The results were positive that speakers found the F0 profiles compatible with all three intonation types, but preferred for the ellipsis to have the longest duration, followed by the comma. The one without punctuation is shortest.

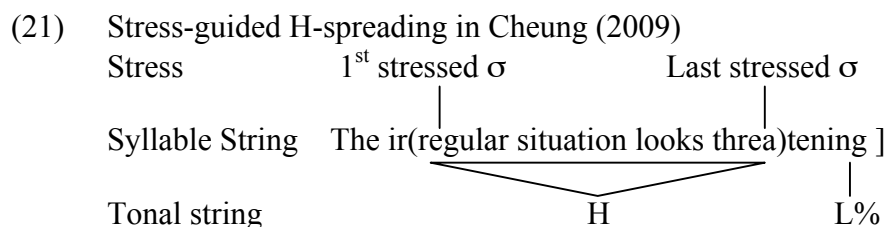
One can also infer from (20g) that the interrogative is marked by a RISE% (or LH% bitonal sequence), contra Gussenhoven’s (2012, 2014) postulation that it is H%.¹² The interrogative boundary is associated with a rise because otherwise, one cannot explain why *yesterday, Tea* is ambiguous in its tonal analysis but plausibly reflects a combination of a lexical H followed by an upstepped H% (possibly resulting from elimination of the L component of LH% in the face of tonal crowding).

In summary, with a fuller understanding enabled by the data in (20), it appears that L in HKE is better understood as a boundary tone than a lexical tone.

5.2 ON THE H AND M TONES IN HKE

¹² See also Yiu’s (2015) phonetic study showing that there is a target H% at the boundary for interrogatives, though the data presented therein would also be consistent with a rise interpretation. Also Chen and Mok’s (2015) phonetic study of the HKE question intonation shows a clear rising contour even when following a high-toned syllable such as *car*.

Cheung's (2009) account of HKE correctly recognized the transitional pitch interpolation between the rightmost H and the L%. However, in Cheung's analysis, the H tones are indicative of stress. For Cheung, HKE words are marked for stresses, which surface as H. According to her, all syllables sandwiched between H tones receive H tone through spreading, an operation that applies across words and phrases, to be blocked only by L%, as illustrated in (21).



Cheung attributes the span of H tones in a sentence like *the irregular situation looks threatening* to syllables she identifies as carrying either primary or secondary stress. Such plateaus of H tones are found also in British English (Wells 2006:113 and Urban North British in Ladd 2008:128), though I will explain later in this section that the situation in HKE is probably not best thought of in terms of metrical stress.

Unlike Cheung, this paper derives the pattern in (21) differently, first by identifying *irregular* as having the o-H-o-o tone pattern, *situation* as H-o-H-o (or possibly H-H-H-o), *looks* as H and *threatening* as H-o-o. The span of H would still be obtained through H-spreading and the association of L% would be treated the same as in Cheung. The difference between the position of this paper's and Cheung's lies in (i) whether or not H is lexically assigned as tone or metrically as stress and (ii) if spreading crosses word boundaries. In Cheung's analysis, M is treated as a default pitch for toneless syllables.

With respect to the second point, section 4.4 and section 4.5 have shown that M is capable of blocking H-spreading, contrary to Cheung's assumption that M is merely a default pitch. As we have seen, M is probably best treated as a word-initial boundary tone. This is a relatively minor difference between Cheung's treatment and that advocated in this paper and Cheung's account can be easily tweaked to accommodate the effects of M.

Cheung's treatment that H is metrical warrants scrutiny. The obligatoriness of a H tone in a HKE word may argue in favor of a stress-based analysis in which high tone is the tonal manifestation of stress inherited from standard varieties of English. Such an approach would be consistent with the common cross-linguistic link between high tone and stress (de Lacy 1999 and 2002). For example, in Lithuanian, H is inserted on the stressed syllable; in Digo Zulu, the H tone moves to the stressed syllable; in Golin Mixtec, stress assignment avoids syllables with low tones; in Vedic Sanskrit, H is deleted from unstressed syllables (Yip 2002:97).

My suspicion is that the stress-based account of HKE tone is highly intuitive because the historical origin of HKE likely biases the analyst in favor of treating HKE like English. In fact, there are a number of reasons against a metrical treatment of HKE. Firstly, as seen in section 3, the H tone occurs in all combinations for di- and trisyllabic words. In a metrical system, one would not expect the possibility of adjacent H tones, as in cases like *sometimes* or any of the examples in (5b) and (6a, c).

Secondly, stress is highly elusive to HKE speakers, many of whom are unable to identify which syllables are stressed. Literature of stress in HKE (notably Hung 2005 and Setter et al 2010) have not presented any evidence for stress, phonetic or

phonological, merely indicating the syllables the researchers believed were stressed. In fact, there is evidence to the contrary in Hung (2005), who reports that there are no prosodic differences between *PROgress* and *proGRESS*, *CONduct* and *conDUCT* and other cases where stress would make a syntactic category distinction. This is true even among highly educated HKE speakers who had American or British-speaking teachers and ample access to Hollywood movies and American TV. This is true also of many who are English professors at the university. Among the speakers I interviewed, those who were able to inform me where stresses fell on certain words said they had to learn it by rote, citing *maintenance* as an example. These speakers report that they had to learn the pronunciation *MAINtenance* because otherwise they would have read it as *mainTAINance*.

Thirdly, HKE speakers do not apply vowel reduction or diphthongization automatically even with stress-attracting suffixation. *Theatricality* is a hard word for many HKE speakers, often coming out as [ti.e.tri.kə.li.ti], with a H on the first syllable and pitch falling via interpolation until the L% in [ti]. Again, HKE speakers who pronounced *theatricality* with a fuller vowel [æ] reported that they had to learn it by explicit instruction. These words are not isolated cases and can be easily verified with the use of nonce words.

Fourthly, tones can spread, but not stress. And it can be shown that the spread of H tones in HKE is not of the same nature as the spreading of the high pitch correlate of stress that is sometimes observed in varieties of English where stress is clearly employed. Wells (2006:209) provides an example with the utterance *Well, 'make up your mind*, the accent falling on 'make and 'mind. This utterance may have, among other possible pitch profiles, one in which high pitch spans from *make* to *mind*, which ends in a fall so that it sounds something like *well, MAKE UP YOUR MInd*. In this case, we see the spread of the high pitch correlate of stress, though stress itself does not spread. Further, Wells (2006:213) observes a downstep between *must* and 'make in *you 'really must 'make up your mind*.

HKE tone displays very different behavior. In HKE, the H spreads rightward to the end of a polysyllabic word even if the initial syllable of the next word is M (recall (13a) *overhead projector*, where H from *o-* spreads to *-head* even though *pro-* is M). This is therefore not the same kind of plateauing effect due to being sandwiched by Hs. The H-spread in HKE can be blocked by M. More importantly, H-spreading in HKE is not sensitive to metrical alterations due to focal contrast. In standard varieties of English, an utterance like *the prinCESS yelled, not the prinCES yelled* would have shifted stress and a concomitant shift of H pitch. However in HKE, the utterance would have the tone sequence M-H-H-F, H-M-H-H-F, where *princess* and *princes* are both H-H. Even if the need for contrast were removed, *princess* would still be H-H. To create the desired focus, HKE speakers would change the volume and duration of the contrasted syllables, spreading H tone according to the rules governing tone spread in HKE, oblivious to metrical alterations.

In sum, the distribution of H in HKE, the elusiveness of stress, the absence of other stress-related phenomena like vowel and length alternations, the insensitivity of H-spread in HKE to metrical shifts and the divergence between H tone spreading in HKE English and stress-associated H tone plateauing in certain varieties of English all work against a metrical treatment of the H tone in HKE. Thus even if the H tone might have historically come from a transparent mapping of English stress, the pitch patterns in modern HKE behave in ways that require an analysis that is not reminiscent of a stress language.

In summary, while insightful in certain respects, earlier accounts of HKE tone fail to provide the empirical coverage afforded by the analysis proposed in this paper.

6. Sino-Anglo Angles on Hong Kong English Tonology

The preceding sections have described at length the tonal patterns in HKE, both at the word level and at the intonation level. This section attempts to relate HKE tones to two of its source languages, Cantonese and British English, with a side glance at another variety of English, Singapore English, with superficially similar properties to those found in HKE.

6.1 TONE FROM CANTONESE

Given that HKE developed in a context where a tone language (Cantonese) is spoken, it is reasonable to wonder if indeed the tones of Cantonese have transferred into HKE. Cantonese has six different tones, listed in (22).

(22) Cantonese Tones for the Syllable [fən]

Tone Category	Tone Contour	Meaning
1	High flat	Divide
2	High rising	Powder
3	Mid	Sleep
4	Very low flat/falling	Grave
5	Low rising	Anger
6	Low flat	Portion

The relevant tones for comparison with the HKE tones H, M and L would be Tone 1, Tone 3, Tone 4 and Tone 6. An experiment was reported in Wee (2013) and Wee and Liang (2015), which found that only F0 values of the HKE H tone matched those of Cantonese Tone 1. The M tone in HKE appeared sometimes to match Tone 3 for some speakers, but never Tone 6 and the L tone did not correspond phonetically to either Tone 4 or Tone 6. This result is predicted by the present analysis because H is the only lexical tone in HKE, akin to the lexical tones that are underlying stipulated for Cantonese words. The HKE L% is a boundary tone and therefore unsurprisingly has no Cantonese correspondence. The M tone is assigned at the word level in HKE, but it is not a lexical tone. Presumably that is why M appears to match the Cantonese Tone 3 for some speakers but not all.

6.2 PROSODY MARKS FROM ENGLISH

Section 5 argued that the H tone in HKE is tonal and the preceding sub-section has suggested that the H tone could have come from Cantonese. Even if H in HKE is unlike stress marking, it is still possible that it had an English source, a position that is at least partially substantiated in a comparison of the two varieties (23). Primary stress is marked with a double underline and secondary stress with a single underline.

(23) Comparison between HKE and English stress

	HKE	Wells (1990) British English ¹³	Oxford English Dictionary ¹⁴
i.	H-o	<u>glory</u> , <u>clockwise</u> , <u>greeted</u>	
ii.	H-H	<u>sometimes</u> , <u>outsell</u> , <u>inborn</u>	<u>inborn</u>
iii.	o-H	<u>create</u> , <u>giraffe</u> , <u>before</u>	
iv.	H-o-o	<u>testify</u> , <u>beautiful</u> , <u>popular</u>	
v.	H-o-H	<u>runaway</u> , <u>roundabout</u> , <u>go-between</u>	<u>runaway</u> , <u>roundabout</u> , <u>go-between</u>
vi.	H-H-o	<u>kidnapper</u> , <u>handwriting</u> , <u>newspaper</u>	<u>kidnapper</u> , <u>handwriting</u>
vii.	H-H-H	<u>undersold</u> , <u>overwrite</u> , <u>kangaroo</u>	<u>overwrite</u> , <u>kangaroo</u>
viii.	o-H-o	<u>prohibit</u> , <u>emergence</u> , <u>erotic</u>	
ix.	o-H-H	<u>about-turn</u> , <u>Repulse Bay</u> , <u>alarm clock</u>	<u>about-turn</u>
x.	o-o-H	<u>comprehend</u> , <u>dislocate</u> , <u>recommend</u>	<u>comprehend</u>

Cases where the OED differs from Wells (1990) are provided in the rightmost column. Wells and the OED differ primarily in that the former provides secondary stresses; there are, however, some words in which there are other differences as in (23ii, vii) where the locus of primary stress appears to be different. Considering both the stress patterns in Wells and the OED, it is possible that the H tone of HKE words corresponded to the stresses of a particular English pronunciation, perhaps depending on when the word entered HKE.¹⁵

Wee and Cheung's (2015) study of the 19th century *Cantonese-English Instructor* revealed that English words in that period were transliterated in such a way that stressed syllables received Cantonese tones that are likely to be higher than surrounding unstressed syllables. These very same syllables appear to have evolved into H toned syllables in modern HKE. Despite the apparent close mapping between stress and H tone, it is not necessarily the case that modern HKE H tones are indicative of stress though they may have had such functional beginnings. The crucial consideration to note is that what is history is history. Even if stresses were productively transferred into HKE as H a century or so ago, modern HKE could easily have grammaticized that mapping as tone. In support of this prosodic transfer from stress to tone, modern HKE speakers seem unable to identify if a syllable is stressed, but they can readily point out if a syllable has a higher pitch. In addition, tones appear stable even when truncation applies to shorten words. For example, consider the combined school subject including *physics* [fi:.siks] with tone H-L, *chemistry* [k^hem.mi.stri] H-Mf-L and *biology* [pai.ɔ.lə.tʃy] M-H-Mf-L is referred to in HKE as *phy-chem-bi* [fi:.k^hem.pai] with the tone pattern H-H-M/L, where the final syllable [pai] surfaces as L% if utterance final (see also Silverman 1992:(40)). Similarly,

¹³ With the exception of *Repulse Bay* which was not listed. British English is chosen as the primary basis for comparison because it is the model used in Hong Kong schools.

¹⁴ OED (<http://www.oed.com>, accessed 8 Sep 2013). Stresses for *runaway* and *roundabout* are indicated as US pronunciation. Thanks to the associate editor whose remarks guided me in this direction.

¹⁵ Familiarity with Hong Kong's colonial past might lead one to wonder, at the risk of committing the comparative fallacy (see Mohanan 1992 for particularly enlightening reasons to be careful when studying non-native varieties of Englishes), if one could test for H-shifts the way stress shifts with class I suffixes like *theatre*, *theatrical*, *theatricality*. This is actually rather tricky to do for HKE speakers because we do not know if HKE speakers make a distinction between class I and class II affixation even if we know they make a distinction between affix and stem. I shall remain agnostic on this front given that it has been subject to inadequate research.

professional M-H-Mf-L is shortened to *pro* M,¹⁶ *sorry* H-L is truncated in HKE as *sor* H and *financial secretary* M-H-H#H-Mf-Mf-Mf-L is *fin sec* [fin.sek] M-H. The final case is especially interesting because the shift [fai]→[fin]¹⁷ had no impact on the tonal manifestation of the first syllable. In all the cases, the tones appear to be assigned before truncation applies. These all suggest that perhaps the H tones are part of the lexical specification of the HKE words. Indeed, as has been demonstrated in preceding sections, treating HKE as tonal provides more comprehensive coverage of the data.

6.3 SINGAPORE ENGLISH AS A COUSIN

Sharing HKE's historical and demographic background is Singapore, also a former British colony with a strong Chinese presence. What is different about Singapore is that there is great diversity even across the ethnic Chinese, so Cantonese was not the dominant Chinese language in Singapore. There is also a significant presence of Malay and a handful of Indian languages, which together make it difficult to discern the linguistic sources of various phonological aspects of Singapore English (henceforth SgE), (see Lim 2009, 2011, 2014 and Ng 2012 for discussion).

Of particular interest is Ng (2011) whose descriptions of SgE tone patterns are given below.

- (24) Singapore English Tone Patterns (adapted from Ng 2011)
- a. High tone (H) is assigned to the final syllable of the phonological word.
 - b. Mid tone (M) spans all non-final stressed syllables.
 - c. Low tone (L) is assigned to initial unstressed syllables.
 - d. Remaining unstressed syllables receive mid tone by rightward spreading from stressed syllables.
- e.g. *sée* (H), *Énglish* (MH), *élephant* (MMH), *Índonésia* (MMM),
machíne (LH), *hibíscus* (LMH), *América* (LMMH)

In Ng's account, the stressed syllables, indicated in (24) with an accent, receive M tones that spread until the penultimate syllable. Final syllables receive H and initial syllables, if unstressed, receive L. Ng's main phonetic evidence for stress in SgE comes from vowel intensity, albeit noting the absence of pitch and duration correlates as well as the paucity of studies to support any claim of stress perception by SgE speakers.

Interestingly, SgE has a stretch of Ms that appear to be a parallel to the span of Hs in HKE. If indeed SgE tones are analyzable as stress, one might explore the same strategies for HKE. However, the M-span inside an SgE word is never broken, which would mask any tone assignment that might look like the type found in HKE, where given a trisyllabic word, all possible combinations (=7) of H-assignment are attested. For this reason, while it might be possible to maintain a stress-based analysis for SgE, one might be tempted to see if the pitch patterns in SgE might also yield to a tonal treatment parallel to HKE.

¹⁶ Interestingly, *pro* does not surface as F, suggesting that it was truncated in HKE rather than borrowed straight from the English *pro*.

¹⁷ Not a case of vowel reduction, but a case of spelling pronunciation.

7. Conclusion

Hong Kong English has a distinctive tonal flavor that first caught the attention of linguists at the turn of the millennium. This paper began with a phonetic description of the basic F0 profiles of basic tones describable as H(igh), M(id) and L(ow).

From the full set of pitch patterns found in di- and trisyllabic HKE words, it is possible to discern that HKE uses H tone lexically in combination with any string of syllables. By identifying that the declarative utterance final is a L% and the word-initial boundary is M, all the pitch patterns of HKE can be easily derived. In so doing, this paper informs a growing literature on the importance of separating pitch effects at the word-level from those that apply to the phrase or utterance.

REFERENCES

- BOERSMA, PAUL, and DAVID WEENINK. 2012. Praat: doing phonetics by computer [Computer program]. Version 5.3.23, retrieved August 2012 from <http://www.praat.org>.
- BOLTON, KINGSLEY. 2002. *Hong Kong English: Autonomy and creativity*. Hong Kong: Hong Kong University Press.
- BOLTON, KINGSLEY. 2003. *Chinese Englishes a sociolinguistic history*. Cambridge: Cambridge University Press.
- BOLTON, KINGSLEY, and SHIRLEY LIM. 2000. Futures for Hong Kong English. *World Englishes* 19.429-443.
- CHAN, YUEN-YING. 2000. Language in context: The English language media in Hong Kong. *World Englishes* 19.323-335.
- CHEN, SHUWEN, and PEGGY P.K. MOK. 2015. Question intonation in Hong Kong English: Interaction between Cantonese and English. *Proceedings of the 18th International Congress of Phonetic Sciences*. Glasgow, UK: the University of Glasgow. ISBN 978-0-85261-941-4. Paper number 272 retrieved from <https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2015/Papers/ICPHS0272.pdf>
- CHEUNG, WINNIE H.Y. 2009. Span of high tones in Hong Kong English. *Proceedings of the 35th annual meeting of Berkeley Linguistics Society (BLS 35)*, 72-82. Berkeley, CA.
- DE LACY, PAUL. 1999. Tone and prominence. *ROA#333-0799*.
- DE LACY, PAUL. 2002. The interaction of tone and stress in Optimality Theory. *Phonology* 19.1-32.
- DUANMU, SAN. 2008. A two-accent model of Japanese word prosody. *Toronto Papers in Linguistics* 28.29-48.
- GOLDSMITH, JOHN (ed.). 1995. *The handbook of phonological theory*. Oxford: Blackwell.
- GORDON, MATTHEW. 2014. Disentangling stress and pitch accent: A typology of prominence at different prosodic levels. *Word stress: Theoretical and typological issues*, ed. by Harry van der Hulst, 83-118. Cambridge: Cambridge University Press.
- GUSSENHOVEN, CARLOS. 2012. Tone and intonation in Cantonese English, In *TAL-2012*, paper O3-04, accessed on 25 Dec 2014 from http://www.isca-speech.org/archive/tal_2012/tl12_O3-04.html.

- GUSSENHOVEN, CARLOS. 2014. On the intonation of tonal varieties of English. *The Oxford handbook of world Englishes*, ed. by Markku Filppula, Juhani Klemola, and Devyani Sharma. Online Publication Date: Dec 2014. DOI: 10.1093/oxfordhb/9780199777716.013.29.
- HERMAN, REBECCA. 1996. Final lowering in Kipare. *Phonology* 13:171–196.
- HUNG, TONY T.N. 2000. Towards a phonology of Hong Kong English. *World Englishes* 19:337-56.
- HUNG, TONY T.N. 2005. Word stress in Hong Kong English: A preliminary study. *HKBU Papers in Applied Language Studies* 9:29-40.
- HYMAN, LARRY M. 2006. Word prosodic typology. *Phonology* 23:225-257.
- HYMAN, LARRY M. 2009. How (not) to do phonological typology: The case of pitch accent. *Language Sciences* 31:213-238.
- ISHIHARA, SHUNICHI. 2000. Continuous linguistic tonetic representation using polynomial residuals. *Proceedings of the 8th Australian International Conference on Speech Science and Technology*, ed. by M. Barlow, 218-223.
- JOHNSON, ROBERT KEITH. 1994. Language policy and planning in Hong Kong. *Annual Review of Applied Linguistics* 14:177-99.
- LADD, D. ROBERT. 2008. *Intonational phonology*. Cambridge: Cambridge University Press, 2nd ed.
- LANIRAN, YETUNDE. 1992. *Intonation in tone languages: The phonetic implementation of tones in Yoruba*. Ithaca: Cornell University PhD dissertation.
- LIM, LISA. 2009. Revisiting English prosody: (Some) New Englishes as tone languages? *The typology of Asian Englishes*, ed. by Lisa Lim and Nikolas Gisborne, Special Issue, *English World-Wide* 30:218-239.
- LIM, LISA. 2011. Tone in Singlish: Substrate features from Sinitic and Malay. *Creoles, Their Substrates and Language Typology, (Typological Studies in Language 95)*, ed. by Claire Lefebvre, 271-287. Amsterdam/ Philadelphia: John Benjamins.
- LIM, LISA. 2014. Yesterday's founder population, today's Englishes: The role of the Peranakans in the (continuing) evolution of Singapore English. *The evolution of Englishes*, ed. by Sarah Buschfeld, Thomas Hoffmann, Magnus Huber, and Alexander Kautzsch, 401-419. Amsterdam/ Philadelphia: John Benjamins.
- LO, ANNA WING SZE. 2015. *Impact of lexical prosody on word identification by Hong Kong English users*. Hong Kong: Hong Kong Baptist University Honours Project.
- LUKE, KANG KWONG. 2000. Phonological re-interpretation: The assignment of Cantonese tones to English words. *ICCL 9*. National University of Singapore.
- LUKE, KANG KWONG, and JACK C. RICHARDS. 1982. English in Hong Kong: Function and status. *English World-Wide*, 3:47–64.
- MOHANAN, K.P. 1992. Describing the phonology of non-native varieties of a language. *World Englishes*, 11:111-28.
- NG, E-CHING. 2011. Reconciling stress and tone in Singaporean English. *Asian Englishes: Changing perspectives in a globalised world*, ed. by Lawrence J. Zhang, Rani Rubdy and Lubna Alsagoff, 48-59. Singapore: Pearson Longman.
- NG, E-CHING. 2012. Chinese meets Malay meets English: Origins of Singaporean English word-final high tone. Special issue of the *International Journal of Bilingualism* 16(1): 83–100. doi: 10.1177/1367006911403216.
- PANG, TERENCE T. T. 2003. Hong Kong English: A stillborn variety? *English Today* 19:12-18.
- PIERREHUMBERT, JANET B., and MARY E. BECKMAN. 1988. *Japanese Tone Structure*. Cambridge, Massachusetts: MIT Press.

- PRIETO, PILAR, CHI-LIN SHIH, and HOLLY NIBERT. 1996. Pitch downtrends in Spanish. *Journal of Phonetics* 24.445–473.
- SETTER, JANE, CATHY S.P. WONG, and BRIAN H.S. CHAN. 2010. *Dialects of English: Hong Kong English*. Edinburgh: the Edinburgh University Press.
- SILVERMAN, DANIEL. 1992. Multiple scansion in loanword phonology: Evidence from Cantonese. *Phonology* 9.289-328.
- TAY, MARY W. J. 1991. Southeast Asia and Hong Kong. *English around the world: Sociolinguistic perspectives*, ed. by Jenny Cheshire, 319-332. Cambridge: Cambridge University Press.
- TRUCKENBRODT, HUBERT. 2004. Final lowering in non-final position. *Journal of Phonetics* 32.313-348.
- WEE, LIAN-HEE. 2008. Phonological patterns in the Englishes of Singapore and Hong Kong. *World Englishes* 27.480-501.
- WEE, LIAN-HEE. 2013. Comparison of F0 profiles in Hong Kong Cantonese and Hong Kong English, Annual Research Forum (ARF 2013), Hong Kong Polytechnic University, 31 Nov 2013. Accessed on Jul. 2015 from <http://staffweb.hkbu.edu.hk/lianhee/Phonlab/Projects/ARF2013.pdf>
- WEE, LIAN-HEE, and WINNIE H.Y. CHEUNG. 2015. The *Chinese-English Instructor's* lesson for Hong Kong English. *Capturing Phonological Shades within and across Languages*, ed. by Yuchau E. Hsiao and Lian-Hee Wee, 342-388. Newcastle upon Tyne: Cambridge Scholars Publishing.
- WEE, LIAN-HEE, and YUAN LIANG. 2015. Cong yueying jipin bijiao kan gangshiyingyu shengdiaode xingzhi [The nature of Hong Kong English tones as seen through a comparison of F0 profiles with Hong Kong Cantonese] (In Chinese). To appear in *Yuyanxue Luncong*.
- WELLS, J. C. 1990. *Longman pronunciation dictionary*. New York: Longman.
- WELLS, J.C. 2006. *English Intonation: an introduction*. Cambridge: Cambridge University Press.
- XU, YI. 2012. ProsodyPro.praat. [Praat script] Accessed on Aug. 2012 from: <http://www.phon.ucl.ac.uk/home/yi/ProsodyPro/>
- YIP, MOIRA. 2002. *Tone*. Cambridge: Cambridge University Press.
- YIU, SUKI S.Y. 2015. Intonation of statements and questions in Cantonese English: Acoustic evidence from a smoothing spline analysis of variance. *Proceedings of the 18th International Congress of Phonetic Sciences*. Glasgow, UK: the University of Glasgow. ISBN 978-0-85261-941-4. Paper number 1018 retrieved from <https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2015/Papers/ICPHS1018.pdf>
- ZHANG, JIE. 2001. *The effects of duration and sonority on contour tone distribution--Typological survey and formal analysis*. Los Angeles: UCLA PhD dissertation.
- ZHU, XIAONONG. 1999. Shanghai tonetics. *Lincom Studies in Asian Linguistics* 32, Muenchen: Lincom Europa.