

Underspecified tone in Cantonese English

1. Tonal underspecification

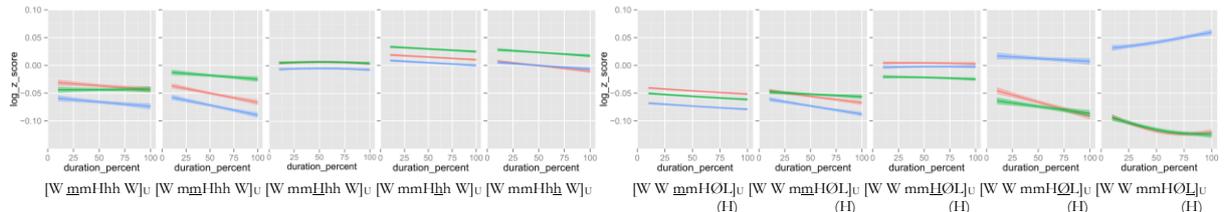
Languages with tonal underspecification have an absence of tone (\emptyset) in their tone systems. While underspecified tone is commonly found in the Bantu tone literature (e.g. Pulleyblank 1986, 2006, Archangeli 1988, 2011, Myers 1998), in addition to works on other languages (e.g. Shih 1987 on Mandarin Chinese, Pierrehumbert and Beckman 1988 on Japanese), no precedent work has investigated underspecified tone in intonational languages spoken by people having a tonal mother tongue. In this talk, I present the case of Cantonese English, the variety of English spoken by native Cantonese speakers in Hong Kong. I argue that Cantonese English has a privative tone system: /H, \emptyset /, where \emptyset syllables either receive derived tones or retain their tonal underspecification on the surface. The evidence is based on a smoothing spline analysis of variance (SS ANOVA) (Gu 2002/2013) to the LZ-scored F0 data.

2. Cantonese English

Considering that Cantonese English is the English spoken by Cantonese speakers, it is likely that other than the English lexicon, its grammar and phonology are under the substrate influence of Cantonese. Since stress is not a property found in Cantonese, it is reasonable to not assume stress in Cantonese English. Previous studies (e.g. Wee 2008, Gussenhoven 2012, 2014, Yiu 2014, 2015) have reported some patterns for its use of pitch. I refer to this systematic linguistic use of pitch as tone. The location of the underlying H is lexically specified. All other tones are systematic, but the location of the H is idiosyncratic. In this talk, two crucial points to report on concerning the tonal analysis of Cantonese English are: 1) The combination of predictable and unpredictable gives rise to the underspecification-in-the-input analysis; and 2) the interpolation that gives rise to the underspecification-in-the-output analysis. This combination further leads to the co-existence of tonal specification and underspecification at the output level.

3. What needs to be specified

In any content words, there is an obligatory H which can be linked to multiple syllables. Surrounding the obligatory H are \emptyset syllables. Here is the SS ANOVA plot of words with a combination of pre-high \emptyset syllables, obligatory H, and more than one post-high \emptyset syllables, such as *'mul.ti.na.tio.nal'*. The SS ANOVA splines in the left and right panels represent tone contours of words in the non-utterance-final (in this case utterance-medial) and utterance-final positions respectively. Splines in red, blue, and green represent statements, questions, and context-neutral utterance types in that order.



SS ANOVA results showed that the manifestation of pitch on \emptyset syllables is sensitive to word boundary, utterance boundary and utterance type. Pre-high \emptyset syllables surface as M whereas the post-high ones either receives H in non-utterance-final words and L% and a H% at the utterance-final boundary of statements and questions respectively, or stay toneless and receives pitch

by interpolation for any remaining post-high \emptyset syllable in utterance-final words. Thus, surface specification and underspecification of \emptyset syllables can co-exist at the same time.

SS ANOVA results also showed an anticipatory effect of the utterance type (i.e. lowering of LZ-scored F0 on syllables of non-utterance-final words to anticipate the H% for question) on the realisation of all \emptyset (realizing as H in non-utterance-final words), H, and M. Also, given that H is phonological which always surface as H while \emptyset syllables surface as M, H or remain toneless by reacting to the boundary and utterance type, this indicates that the anticipatory effect applies to every syllable regardless of their phonological/phonetic status.

4. OT analysis

Two key aspects to be explained are: 1) the co-existence of surface specification and underspecification for tone, and 2) the manifestation of different surface tones on \emptyset syllables in different word position, utterance position and utterance type. The co-existence of tonal specification and underspecification poses a challenge for a synchronic analysis since constraints usually encourage an all-or-nothing specification for tone, let alone predicting the attested tones for different \emptyset syllables.

- * $\emptyset_{\mu} \dots$] All syllables in non-utterance-final words must be specified.
- * \emptyset_{μ}] All syllables in utterance-final words must be specified.
- * $\emptyset \dots H$ No sequences of \emptyset before H, regardless of intervening elements.
- * $H \dots M$ No sequences of H followed by M, regardless of intervening elements.

To capture these in an OT analysis, the key markedness constraints ban \emptyset syllables under certain conditions (e.g. in non-utterance-final words) and disallow certain sequences (e.g. H...M). Interleaving those with faithfulness to input tones from boundary and from utterance type will give us the desired outputs.

5. Conclusions

The privative /H, \emptyset / tone system of Cantonese English introduces an interesting case to phonological-typological studies since it shows reflexes of both Cantonese tone and English intonation, resulting in a system that shares similarities with both Bantu tone and Japanese pitch accent. Formalising the explanation of this tone system in OT is a challenging task owing to the co-existence of surface specification and underspecification, plus the manifestation of different surface tones on different \emptyset syllables. Despite the ‘mixed’ nature of this tone system, the proposed analysis explains it by specifying H in the input, leaving the phonology to specify all others except non-utterance-final post-high \emptyset syllables in utterance-final words, which remain underspecified and receive pitch by interpolation on the surface. Future studies can further look into the theoretical complications that the co-existence of surface specification and underspecification bears in different tone systems.

Selected references

- Archangeli, Diana. 2011. Feature Specification and Underspecification. In *The Blackwell Companion to Phonology*, v. 1, ed. Marc van Oostendorp, Colin Ewen, Elizabeth Hume, and Keren Rice, 148-170. Malden, MA: Wiley-Blackwell.
- Gussenhoven, Carlos. 2014. On the intonation of tonal varieties of English. In *The Oxford Handbook of World Englishes*, ed. Markku Filppula, Juhani Klemola, and Devyani Sharma. Oxford: Oxford University Press.
- Myers, Scott. 1998. Surface underspecification of tone in Chichewa. *Phonology* 15:367-391.
- Pulleyblank, Douglas. 2006. Minimizing UG: Constraints upon Constraints. In *Proceedings of the 25th West Coast Conference on Formal Linguistics*, ed. Donald Baumer, David Montero, and Michael Scanlon, 15-39. Somerville, MA: Cascadilla Proceedings Project.
- Pierrehumbert, Janet, and Mary Beckman. 1988. *Japanese Tone Structure*. Linguistic Inquiry Monograph Series No.15. Cambridge, MA: MIT Press.
- Yiu, Suki. 2014. Tone spans of Cantonese English. In *Proceedings of the 4th International Symposium on Tonal Aspects of Languages*, ed. Carlos Gussenhoven, Yiya Chen, and Dan Dediu, 143-146.