REVISITING THE VOWELS OF HONG KONG ENGLISH – THE POST-HANDOVER GENERATION

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ABSTRACT

Previous research investigating the vowels of Hong Kong English (HKE), a postcolonial variety of English, has suggested mergers between several pairs of vowels. This evidence stems from speakers who grew up before the 1997 handover of Hong Kong to the People's Republic of China. Given the enormous political and social changes since then, we investigate whether we can detect recent diachronic change in the vowels of HKE.

Wordlist vowel data (in carrier phrases) sampling 14 lexical sets from 20 L1 Cantonese-speaking university students was analysed with regard to F1 and F2 (Lobanov-normalised) and duration. Potential vowel mergers were assessed through Support Vector Machines (SVM). Results confirm previous research with regard to mergers between DRESS-TRAP, THOUGHT-LOT and FLEECE-KIT due to great overlap in F1, F2 and duration. However, GOOSE and FOOT are relatively distinct, in contrast to previous research, possibly indicating recent diachronic change.

Keywords: Vowels, monophthongs, Hong Kong English, diachronic change, World Englishes

1. HONG KONG AND HONG KONG ENGLISH

The territory of Hong Kong (HK) was ceded in the 19th century to British colonial rule and subsequently saw rapid economic development and population increase [1]. Its current population of 7 million consists mainly of Cantonese speakers, but also speakers of American and British English, a long-standing South Asian community as well as more recent Filipino, mostly non-permanent, residents [2]. In 1997, authority over HK was handed over to the People's Republic of China, which has ruled it since then as a Special Administrative Region with a degree of autonomy in local matters.

As in other colonial contexts, a local second language (L2) dialect of English emerged in HK over time, shaped by (i) cross-linguistic influence from the L1 Cantonese, (ii) general language learning mechanisms and (iii) the population structure during the early colonial period, with influence from other British colonies, e.g. in South Asia and Malaya (cf. founder effect; [3]).

With the 1997 handover, HK entered an era of profound political, cultural and linguistic realignment. British (English) influence may continue to be relevant due to its historical influence on HKE and in so far as it is ingrained in local education, while American (English) influence is commercially relevant. Perhaps the greatest force driving the development of HKE post-1997 may be internal dynamics (i.e. endonormative forces; [2-3]). A wealth of studies has documented the distinctiveness of HKE on the levels of syntax [4-5], pragmatics [6-7], lexis [8] and phonology [9-10].

Against these fundamental political changes, we ask whether there has been any recent diachronic change in HKE since 1997. For reasons of space, we focus on one particular area of phonology that is often investigated in sociophonetic research, monophthongs.

2. THE PHONOLOGY OF HKE

The present section summarises key results on the monophthongs of pre-handover HKE. Throughout the paper, Wells' lexical sets notation [14] is used, though we also provide each vowel's articulatory value in British Eng. at the first mention.

The absence of a contrast between several pairs of vowels in HKE has been reported based on impressionistic evidence [11]. This concerns FLEECE /i/ and KIT /ɪ/ as well as DRESS /e/ and TRAP /æ/. Moreover, the long (or tense) vowels THOUGHT /ɔ:/ and GOOSE /u:/ were claimed to be shortened in HKE.

Acoustic evidence presented by Hung [12, pp. 340] similarly found an absence of a distinction between FLEECE – KIT, DRESS – TRAP, GOOSE – FOOT and THOUGHT – LOT. Additional acoustic evidence by Deterding, Wong & Kirkpatrick [henceforth DWK] [13] broadly confirmed this assessment, with the modification that THOUGHT – LOT may not be "fully merged" and that GOOSE and FOOT showed substantial fronting.

These features are generally thought to derive from cross-linguistic influence from Cantonese [1], although this influence is not deterministic or

Monophthongs Means
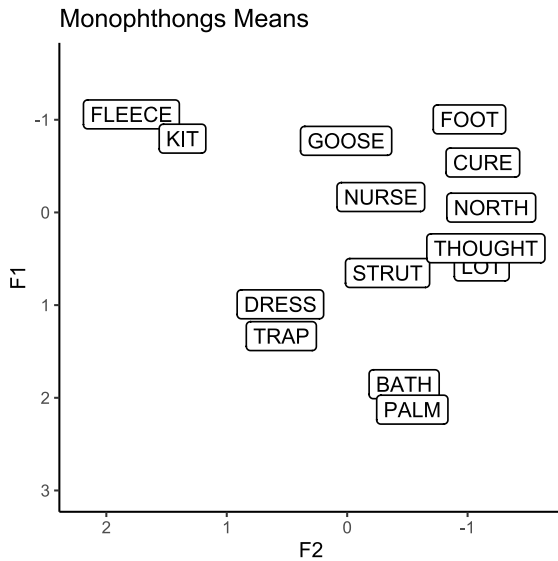
Figure 1. Mean position for all monophthongs.

straightforward. Individual speakers may have different conscious or unconscious orientations to emerging endocentric (local) pronunciation norms or different exocentric norms (such as British or American English).

### 3. AIMS AND RESEARCH QUESTIONS

To summarise, the existing acoustic evidence on the vowels of HKE comes from two studies, which rely on speakers who were born before the 1997 handover [12-13]. Against the fundamental cultural and political changes in HK since then, we ask whether the vowel system of HKE shows evidence of recent diachronic change. We will contrast the existing evidence, stemming from speakers born and raised before 1997, with new data from speakers who were born between 1995 and 2001. These speakers essentially lived their entire lives, and received their education, in post-independence HK. They are thus part of HK's post-handover generation.

More broadly, we also aim to provide an up-to-date acoustic analysis of the vowels of HKE. To this end, we will improve upon existing research by analysing vowel quantity (duration) alongside vowel quality (formants). Moreover, formant data will be normalised to control for anatomical variation in vocal tract length.

### 4. DATA AND METHODS

4.1 Speakers and Data

The 20 (13 f, 7 m) participants of this study were born and raised in HK, spoke Cantonese as their L1, were proficient in English and, at the time of

Monophthongs Set 1
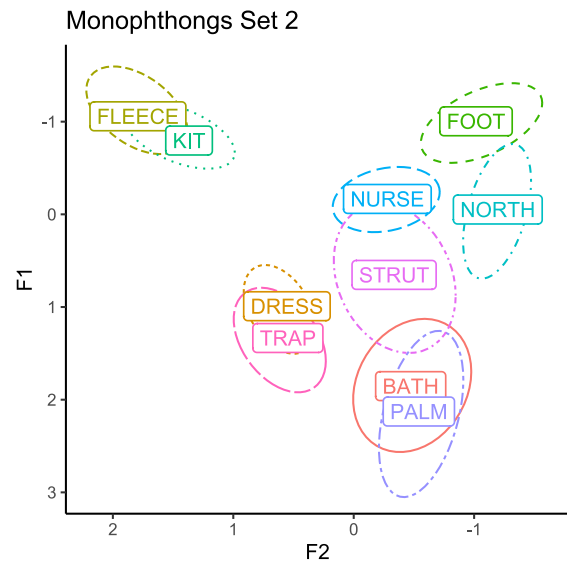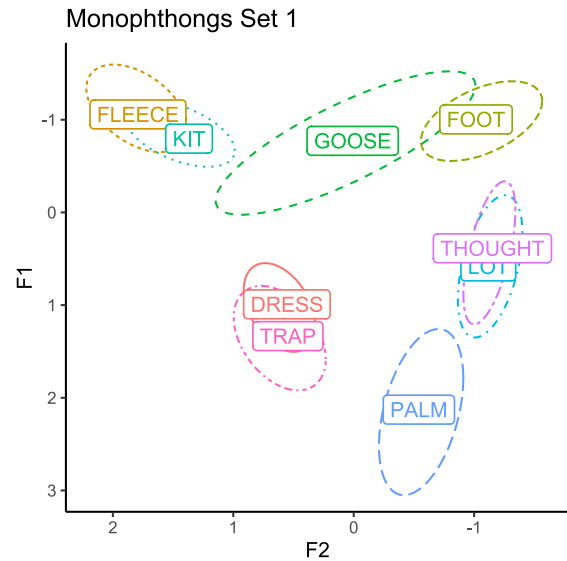
Monophthongs Set 2

Figure 2a and b. Means and 66 % ellipses for all monophthongs, separated into two sets.

recording, were undergraduate students at several universities in HK (in English-medium programmes, with two exceptions). We elicited read speech in the form of a wordlist in carrier phrases and a ten-minute informal conversation between each participant and the interviewer (the first author, native to HK). For reasons of space, we here focus on the wordlist data (duration 55 - 139 s.). The wordlist items were chosen from Wells' lexical sets [14, pp. 127-169], supplemented by further English words. 14 lexical sets were elicited with at least two distinct keywords (except for three lexical sets, which were elicited only once). In total, each speaker produced 26 lexical items.

Recordings were made with a Zoom H1n handheld recorder. Participants filled in a questionnaire to provide linguistic and demographic
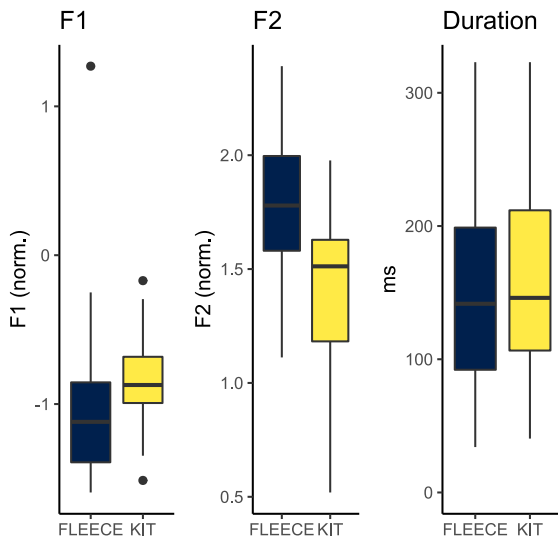
Figure 3. Distribution of F1, F2 and duration for FLEECE and KIT.

background information and consented to the research procedure prior to data collection.

4.2 Analysis

The recordings were phonemically annotated through forced alignment with Webmaus [15] and subsequent manual correction. Of the 520 recorded words, 10 were removed due to mispronunciations (mostly as initialisms). For the remaining items, duration as well as the first and second formants were extracted at 50 % and 80 % of vowel duration through a Praat script. Formants were then normalised with the vowels package in R, using the Lobanov method [16]. All vowel charts display normalised formant frequencies at vowel midpoint and were plotted with ggplot2 in R [17].

We further assess potential vowel mergers with the machine learning method Support Vector Machines (svm) in R (package e1071) [19]. For each potentially merged pair of vowels, F1, F2 and duration are used to predict the vowel in a binary classification task. Over 50 iterations, the data is each time split randomly into a training set (two thirds) and the remaining one third is held out as test set. We average the classification statistic kappa over all 50 iterations, with kappa (accuracy) ranging from 0 to 1.

5. RESULTS

6.1. Overall distribution of monophthongs

The overall distribution of the 14 monophthongs is shown in Figure 1 as means. In addition, Figures 2a and 2b indicate variability with the help

of ellipses (shown in two separate charts to avoid crowding). Visual inspection of the formant charts indicates clear overlap between THOUGHT – LOT and BATH - PALM, some overlap between DRESS – TRAP and FLEECE – KIT and little overlap between GOOSE – FOOT.

A comparison of these results with (somewhat older) data for Southern Standard British English (BrE) [18] indicates the following: There appears to be a merger between THOUGHT and LOT in our HKE data, whereas in BrE THOUGHT has lower F1 and F2 (articulation higher and further back). Further, HKE DRESS only has marginally lower F1 (i.e. slightly higher articulation) than TRAP. By contrast, DRESS is clearly differentiated from TRAP in BrE, where the former has a lower F1 and a higher F2 than the latter (articulation higher and fronter). The degree of overlap between FLEECE and KIT in our HKE sample seems not unlike that found in BrE, except that in the present data the two vowels are mainly differentiated in F2 (frontness) whereas in BrE they are mainly differentiated in F1 (height). Finally, FOOT appears to be articulated with somewhat lower F1 (higher point of articulation) in our HKE data compared to BrE. GOOSE partly has a somewhat higher F1 (lower point of articulation) in HKE than in BrE. Other than that, the degree of fronting of GOOSE in our data to some extent differentiates it from FOOT and is commensurate with the youngest BrE age group (20 – 25) in [18].

6.2. Potential Mergers

In order to investigate potential mergers more closely, we compare F1, F2 and duration in order to assess the distinctness of the vowel pairs. The classification statistic kappa ranges from 0 to 1 (0 = complete merger, 1 = completely separate)

The data for FLEECE – KIT indicate a very limited degree of differentiation (see Fig. 3). Especially noteworthy is that duration is virtually identical. Kappa = 0.26 shows very limited separability, i.e. it suggests a merger.

For DRESS – TRAP, the overlap is even clearer, with just a slight difference in F1 (see Fig. 4). The lack of a difference in duration is once again particularly clear. Kappa is 0.32, i.e. again indicating poor separability.

Finally, THOUGHT – LOT show no difference in F1 or F2, and a slight tendency for a longer duration in THOUGHT (see Fig. 5). For this pair, kappa = 0, i.e. these vowels are not statistically separable.
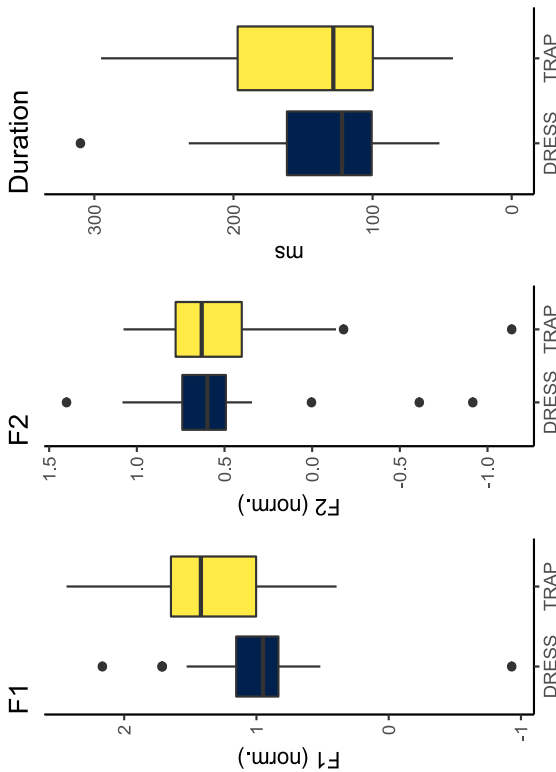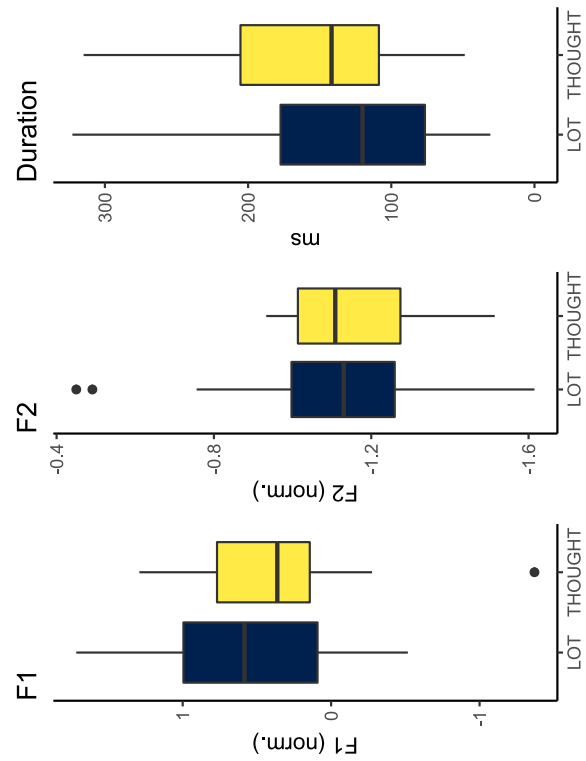
Figure 4. Distribution of F1, F2 and duration for DRESS and TRAP.

Figure 5. Distribution of F1, F2 and duration for LOT and THOUGHT.

7. DISCUSSION

The aim of this paper was to assess potential recent diachronic change in the vowel system of HKE. Our data, drawn from the post-1997 generation, provides some evidence of continuity with pre-1997 patterns. Specifically, we find a virtually complete DRESS – TRAP merger. Against DWK's [13] doubts, but confirming Hung [12], we also find a complete THOUGHT – LOT merger.

Our findings also refine and partly diverge from previous results. Specifically, we do not find a complete FLEECE – KIT merger among our HKE speakers, who produce an F1/F2 contrast that is at least in magnitude comparable to that found in BrE. This result contradicts Hung, but may be partly compatible with DWK, given that they only present mean formant values. However, given that HKE FLEECE and KIT do not differ in duration (unlike in BrE), they are not clearly separable. Finally, like [13], but unlike [12], we find evidence of a considerable degree of GOOSE fronting. However, our speakers produce only a much slighter degree of FOOT fronting. In this, our evidence goes against DWK, but parallels to some extent younger speakers of BrE [18].

Notably, our approach is arguably more sensitive to variability and promises greater technical accuracy than previous research, given (i) our reliance on not only formants but also duration, (ii) the use of vowel normalisation in order to account for anatomical variation in vocal tract length and (iii) the assessment of variability within the data, instead of just relying on mean values. This approach also allowed us to assess to what degree duration may sustain any of the vowel contrasts under investigation. Overall, there appears to be almost no difference in duration between long/short (tense/lax) vowel pairs.

8. CONCLUSION

This paper set out to analyse recent diachronic change in the monophthongs of HKE, without finding clear evidence supporting this hypothesis. This result contradicts our initial assumption that the political and social changes following the handover of HK to the People's Republic of China may have accelerated linguistic change. Nevertheless, our findings indicate that HKE maintains its distinctiveness from other varieties of English such as British and American English. In other words, this result suggests that HKE continues to rely on distinct norms, i.e. it is testament to its endonormativity and linguistic vitality (see also [2]). Finally, in terms of methodology, we

showed how Support Vector Machines can aid the analysis of potential vowel mergers.

8. BIBLIOGRAPHY

[1] J. Setter, C. S. P. Wong, and B. H. S. Chan, *Hong Kong English.* Edinburgh, England: Edinburgh University Press, 2010.

[2] R. Fuchs, "Hong Kong English: Structural features and future prospects," in *Multilingual Global Cities: Singapore, Hong Kong, Dubai,* P. Siemund and J. R. E Leimgruber, Ed., London: Routledge, 2021, pp. 285-302.

[3] W. E. Schneider, *Postcolonial English: Varieties around the world.* New York: Cambridge, 2007, pp. 1-97,133-172.

[4] R. Fuchs, "The frequency of the present perfect in varieties of English around the World," in *Re-Assessing the Present Perfect*, V. Werner, E. Seoane, Ed., Berlin: de Gruyter, 2016, pp. 223-258.

[5] M. Wong, "Verb-preposition constructions in Hong Kong English: A cognitive semantic account," *Linguistics*, vol. 52, no.3, pp. 603-635, 2014.

[6] H. Parviainen and R. Fuchs, "'I don't get time only': an apparent-time investigation of clause-final focus particles in Asian Englishes," *Asian Englishes.*, vol. 21, no. 3, pp. 285-304, 2019.

[7] M. Wong, "Expressions of gratitude by Hong Kong speakers of English: research from the International Corpus of English in Hong Kong (ICE-HK)," *Journal of Pragmatics*, vol. 42, no. 5, pp. 1243-1257, 2010.

[8] H. Wolf and T. Chan, "Understanding Asia by means of cognitive sociolinguistics and cultural linguistics - the example of GHOSTS in Hong Kong English," in *Communicating with Asia: the future of English as a global language*, G. Leitner, A. Hashim and H. Wolf, Ed., Cambridge: Cambridge University Press, 2016, pp. 249-266.

[9] A. Y. W. Chan and D. C. Li, "English and Cantonese Phonology in Contrast: Explaining Cantonese ESL Learners' English Pronunciation Problems," *Lanuage, Culture and Curriculum,* vol. 13, no. 1, pp. 67-85, 2000.

[10] A. Sewell and J. Chan, "Patterns of variation in the consonantal phonology of Hong Kong English," *English World-Wide*, vol. 31, no.2, pp. 138-161, 2010.

[11] K. Bolton and H. Kwok, "The dynamics of the Hong Kong accent: Social identity and sociolinguistic de-scription," *Journal of Asian Pacific Communication 1*, pp. 147-72, 1990.

[12] T. T. N. Hung, "Towards a phonology of Hong Kong English," *World Englishes*, vol. 19, no. 3, pp. 337-356, 2000.

[13] D. Deterding, J. Wong and A. Kirkpatrick, "The pronunciation of Hong Kong English," *English World-Wide*, vol. 29, no. 2, pp. 148-175, 2008.

[14] J. C. Wells, *Accents of English 1: An introduction*, Great Britain: Cambridge University Press, 1982.

[15] T. Kisler, U. D. Reichel and F. Schiel, "Multilingual processing of speech via web services," *Computer, Speech and Language*, vol. 45, pp. 326-347, Sept. 2017.

[16] T. Kendall and Thomas E. R., *vowels: Vowel Manipulation, Normalization, and Plotting. R package version 1.2-2 (2018)*. [Online]. Available: https://CRAN.R-project.org/package=vowels

[17] H. Wickham, *ggplot2: Elegant Graphics for Data Analysis*. New York: Springer-Verlag, 2016.

[18] S. Hawkins and J. Midgley, "Formant frequencies of RP monophthongs in four age groups of speakers," *Journal of the International Phonetic Association*, vol. 35, no. 2, pp. 183-199, 2005

[19] D. Meyer, E. Dimitriadou, K. Hornik, A. Weingessel and F. Leisch. *e1071: Misc Functions of the Department of Statistics, Probability Theory Group (Formerly: E1071)*, TU Wien. 2021. R package version 1.7-5. https://CRAN.R-project.org/package=e1071