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The pre-nasal allophonic splitting of /ɛ/ in Toronto Heritage Cantonese

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Workshop: VariAsian: Contact and Change in Asian North American Speech Communities

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Slides available at:
https://holmantse.github.io/

Heritage Language Variation and Change in Toronto
http://projects.chass.utoronto.ca/ngn/HLVC

University of Toronto
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Sound samples showing a pre-nasal /ɛ/ split

	/ŋ/ (fronted variant)	Open Syllable
isolated	**meng2** ‘name’	**ce1** ‘car’
sentence	M4 hai6 ci5 hai6 zung1 man4 **meng2** gaa3.	Jyu4 gwo2 jau5 di1 pang4 jau5 jau5 **ce1** soeng2 heoi3.
Gloss	“it doesn’t look like a Chinese name”	“if there are friends with a car who want to go … “
Word Sample		
Sentence sample		

Notes:
Jyutping Romanization used
<e> = /ɛ/
Numbers indicate tone categories
Sound files come from C2F41A (second-generation, female, 41-year old Toronto Cantonese heritage speaker)

Questions

- Does Toronto English influence lead to a contact-induced allophonic split in Cantonese /ɛ/?
  - Three sets of comparisons (Nagy 2011)
    - Are there inter-generational differences?
    - Do we find the same change in the Homeland variety (diatopic comparison)?
    - Is there a source structure (cross-linguistic comparison)?
  - Can we show greater likelihood of split based on proficiency?
- What are the implications of these results for the internal/external dichotomy?

Two Perspectives of Internal vs. External Motivation

Sound Change in Variationist sociolinguistics (Labov 2007, 2011)

- Internal (Transmission): child L1 acquisition
  - Chain shifts, splits, mergers
  - Can be structural
- External (Diffusion): adult L2 acquisition and a result of lexical diffusion
  - Only lexical, though possibly structural for mergers

"Deviation" in Heritage Language Research (Polinsky & Scontras 2019)

- Internal: "attrition, which amounts to loss of features, structures, or individual lexical items", "a shrinking of structure"
- External: "very common in the language of first-generation immigrants, but does not always amount to loss"
- CAVEAT: Phonology is different and still a developing area of research

Towards a Language Contact Perspective

- BOTH internally and externally motivated change can be found within communities of heritage language speakers (and more broadly speaking communities with widespread bilingualism and multilingualism)
  - See Thomason & Kaufman (1988), Van Coetsem (2000), Trudgill (2011), Aalberse et al (2019), Muysken (2019) among others
- In fact, Trudgill (2011):
  - Short-term adult L2 acquisition → simplification
  - Long-term childhood bilingualism/multilingualism → complexification
- High proficiency bilinguals drive the complexification process (Trudgill 2011, Muysken 2019, Aalberse et al 2019 among others)

Two problems

- COMPARE
  - **Loss** of English plural marking in Japanese dominant speakers arguably due to transfer of lack of plural marking in Japanese (external motivation), BUT same loss found in other language contact pairs (so could be internal motivation)
    - Vs.
  - Grammaticalization of Malay morphemes to match morpho-syntactic distinctions **(addition)** found in Dutch by Malay heritage speakers who also speak Dutch

1. Muysken (2019) says the latter is more convincing, but such cases seem lacking in studies discussed by Polinsky & Scontras (2019).
   - Does Toronto Cantonese provide an exception?
2. He says this is because of their focus on lower proficiency speakers.
   - Thus, suggesting it is higher proficiency speakers that initiate changes/deviations resulting in increased complexity such as allophonic splits
     - Is this true in Toronto Cantonese?

The Specifics of Toronto Cantonese

Homeland Cantonese

http://lmp.ucla.edu/profile.aspx?menu=004&langid=73

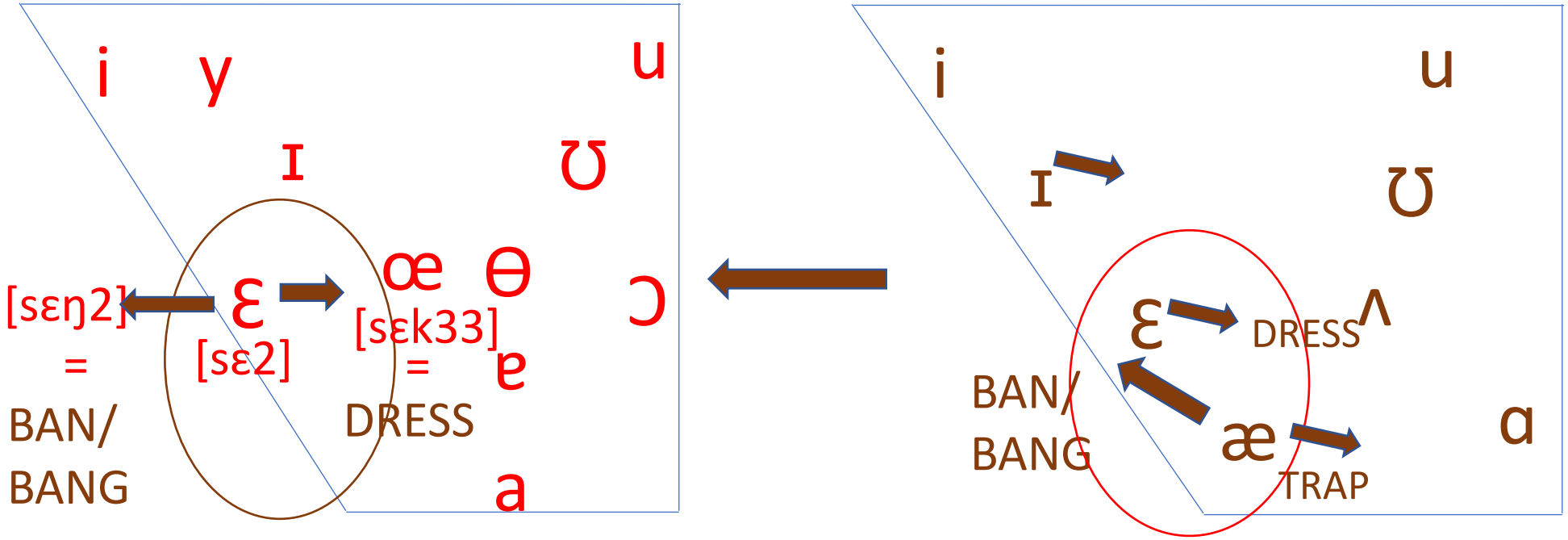
1960s - 1997

Toronto Heritage Cantonese

http://www.whereig.com/images/cities/toronto-location-map.jpg

- **1960s**: First large wave of immigration from Hong Kong (UK Colony ~90% Cantonese speakers) to Canada
- **1980s-1997**: More immigration, motivated by fears of handover to China
- **2011 Census**: 178,000+ (3.1%+ of population) Cantonese speakers in Toronto

Cantonese vs. Toronto English Vowels



	Cantonese /ɛ/	English /ɛ/	English /æ/
Open syllable	[sɛ35], ‘to write’	--	--
Pre-Stop	[sɛk33] ‘to kiss’	DRESS	TRAP
Pre-nasal	[sɛŋ35] ‘to awaken’	TEN	BAN/G

The Data

- HLVC (Heritage Language Variation and Change) Project Corpus (Nagy 2011)
  - Digital recordings (.wav) of:
    1. hour-long sociolinguistic interviews (spontaneous speech sample)
    2. Ethnic Orientation Questionnaire responses
    3. picture naming task responses

Three comparison possible (Nagy 2011)

- HLVC Data makes possible three sets of comparisons ideally suited to address contact-induced change
  1. Intergenerational comparison
     - Is there even a difference to talk about?
  2. Diatopic (two-place) comparison
     - Is the same change happening in the Homeland?
       - If so, contact argument weakened
       - If not, contact argument strengthened
  3. Cross-linguistic comparison (via the Contact in the City Corpus, Hoffman & Walker 2010)
     - Does the purported contact feature exist in the purported source language?
       - If yes, contact argument strengthened
       - If no, contact argument weakened

Speakers

Group	Description	Languages	Age Range	# of speakers
GEN 1 (1st generation) Toronto	Grew up in Hong Kong, immigrated to Canada as adults, and lived in Toronto for at least 20 years	L1 Cantonese, variable L2 (usually adult) English	46-87	12
GEN 2 (2nd generation) Toronto	Grew up in Toronto, parents meet GEN 1 criteria (though parents are not necessarily recorded)	L1 Cantonese (but variable proficiency), L2 English (learned early)	20-44	12
HK (Homeland)	Lifelong Hong Kong residents	L1 Cantonese, variable L2 (usually adult) English	16-77	8
				n = 32

Data Processing

- Vowel tokens measured for midpoint F1/F2 from all three sets of recordings
- Prosodylab aligner (Gorman et al 2011) and Praat script used to obtain midpoint F1 and F2 of all usable tokens of 11 contrastive monophthongs (to create general vowel space)
  - Words with onset glides /j, w/ excluded
  - Manual review of output to ensure accurate formant measurements
- Lobanov Normalization method (Thomas & Kendall 2007)
- Total Tokens: 33,179 (For 11 vowel categories), for vowel space published in Tse (2019)
  - Subset used for current study

Vowel	Tokens of /ɛ/ Included in Analysis
GEN 1	1135
GEN 2	836
HK	548
TOTAL	**2519**

- Mixed effects modeling with R-brul (Johnson 2009)

Results: Inter-generational Comparison

GEN 1

Random Effects: Speaker and Word
n = 1135

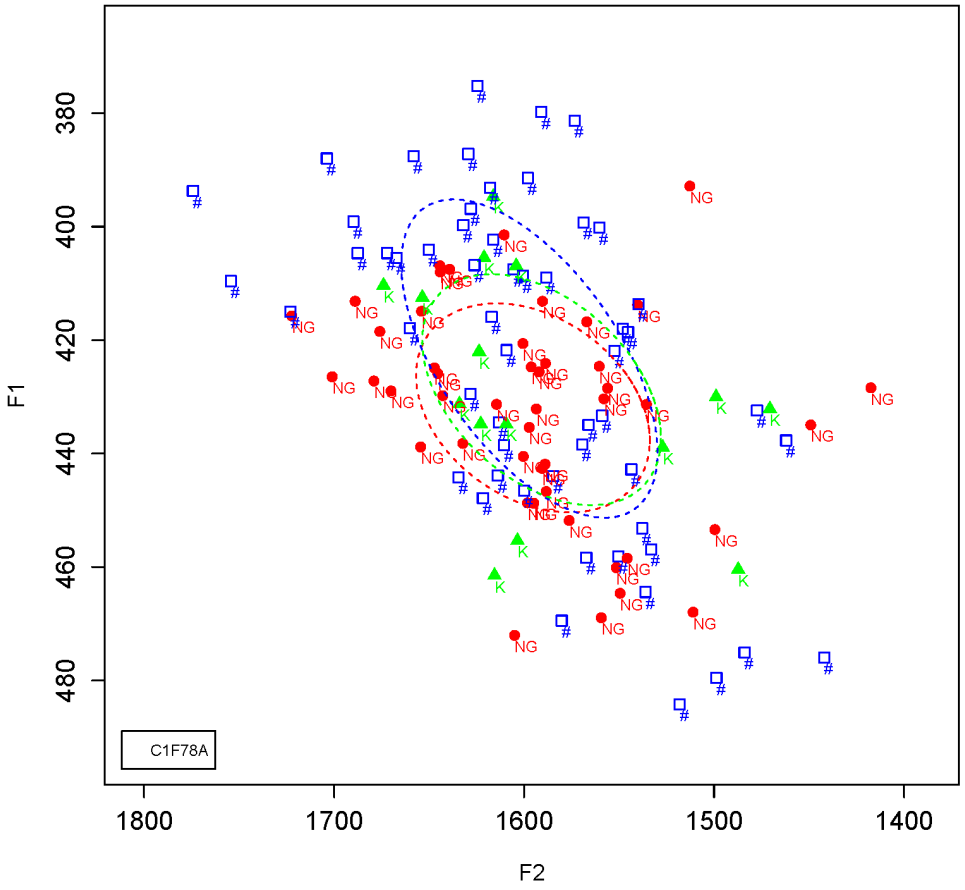
Coda Context (only fixed effect included): not significant

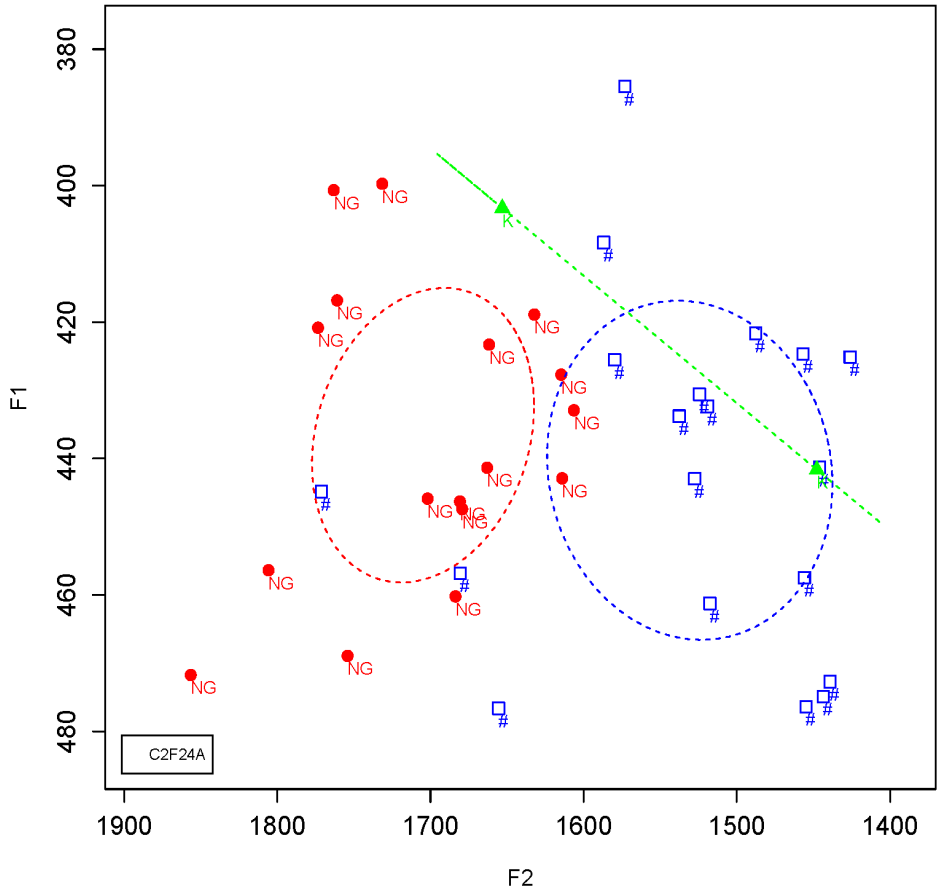
GEN 2

Best Step-down model for Gen 2 Random effects: speaker and word Fixed Effect: Coda Context (p < 0.01)**			
	Coefficient (Hz)	Tokens	F2 Mean (Hz)
/ŋ/	39	258	1619
Open Syl.	-8	538	1564
/t/ or /k/	-30	40	1530
TOTAL		836	
r^2 [fixed] =0.07, r^2 [random] =0.388, r^2 [total] =0.458			

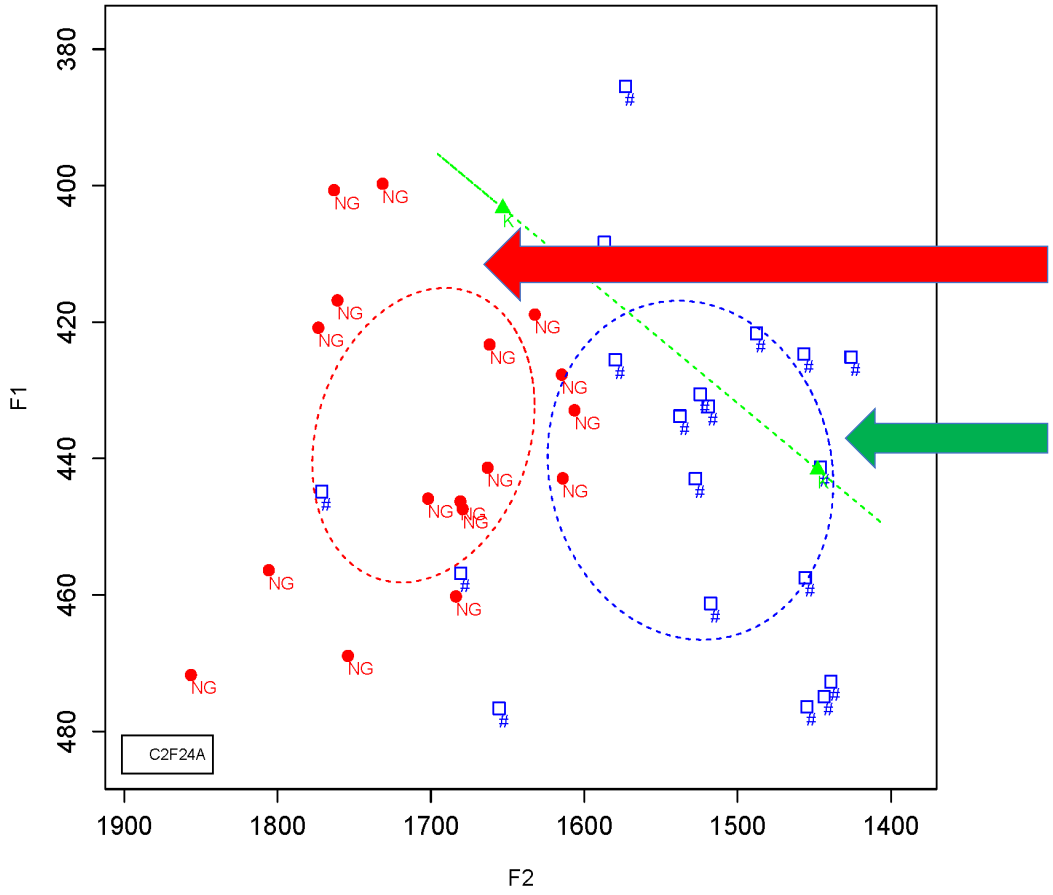
Interpretation: We have something to talk about

A GEN 1 vs. a GEN 2 speaker





Vowel Plot for C2F24A*



Best Step-down Model of the F2 of /ɛ/ with GEN 2 data only
Fixed Effect: Coda Context
Random Effects: Word and Speaker

	Coefficient	Tokens	F2 Mean (Hz)
/ŋ/	46	258	1619
#	-2	538	1564
/t/	-19	2	1554
/k/	-25	38	1529
		836	

r^2 [fixed] = 0.070, r^2 [random] = 0.390
r^2 [total] = 0.460

*GEN 2, female, 24-year old

Results: Diatopic Comparison

HK

Random Effects: Speaker and Word
n = 548

Coda Context: not significant

GEN 2

Best Step-down model for Gen 2
Random effects: speaker and word
Fixed Effect: Coda Context ($p < 0.01$)**

	Coefficient (Hz)	Tokens	F2 Mean (Hz)
/ŋ/	39	258	1619
Open Syl.	-8	538	1564
/t/ or /k/	-30	40	1530
TOTAL		836	
r^2 [fixed] =0.07, r^2 [random] =0.388, r^2 [total] =0.458			

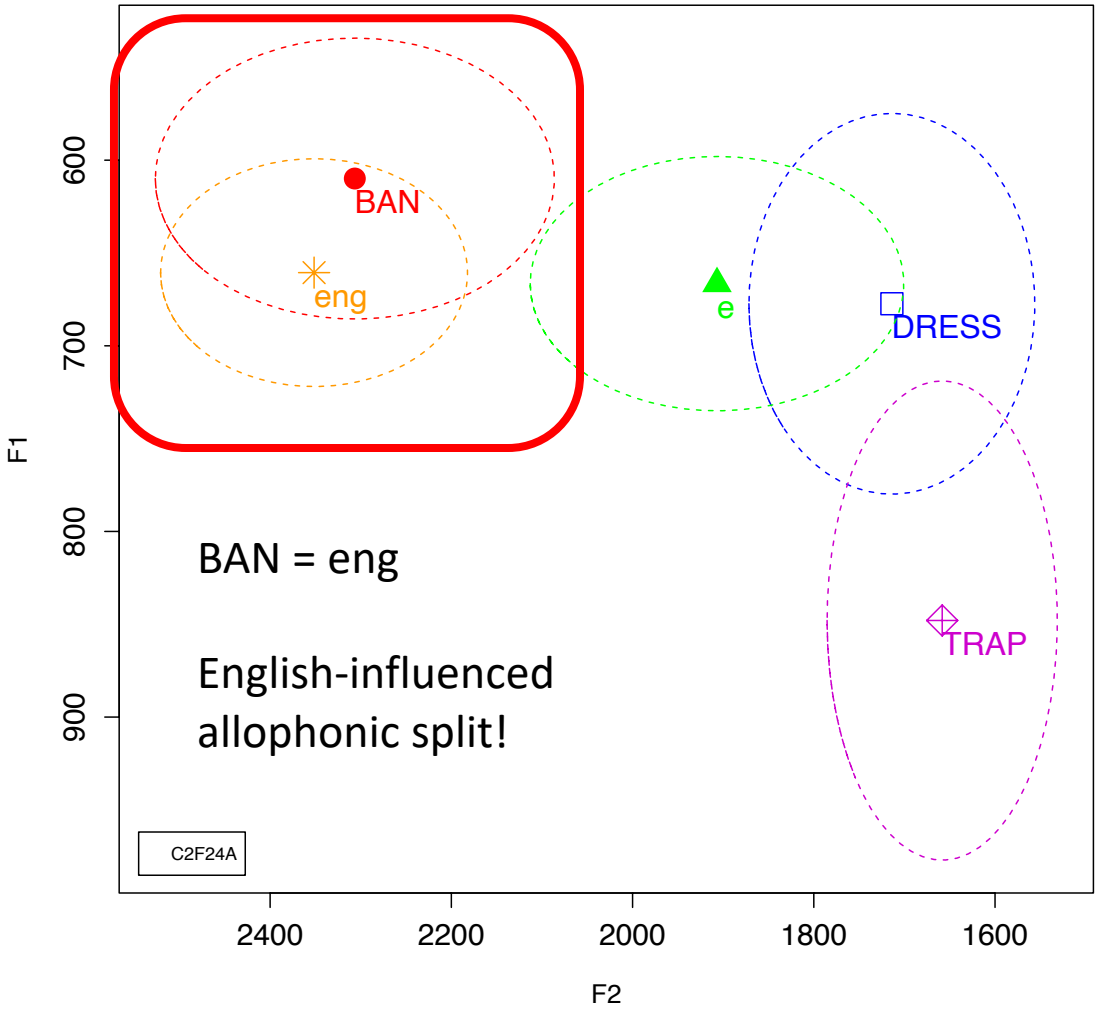
Interpretation: Contact argument strengthened

Cross-linguistic comparison (somewhat post-hoc)

- Implicit or assumed in many previous studies
- English vowels from C2F24A included for cross-linguistic comparison.
  - Interviews primarily in Cantonese, BUT speakers allowed to code-switch
  - C2F24A produced enough English speech for acoustic analysis
- Unnormalized F1/F2 values used

Vowel Class	Tokens Included in Analysis
DRESS	10
TRAP	74
BAN	38
TOTAL	**2519**

Results: Cross-linguistic Comparison with C2F24A



- <u>Cantonese</u>
  - eng = [ɛŋ]
  - e = [ɛ]
- <u>English</u>
  - BAN = pre-nasal [æ]
  - TRAP = [æ] elsewhere
  - DRESS = /ɛ/

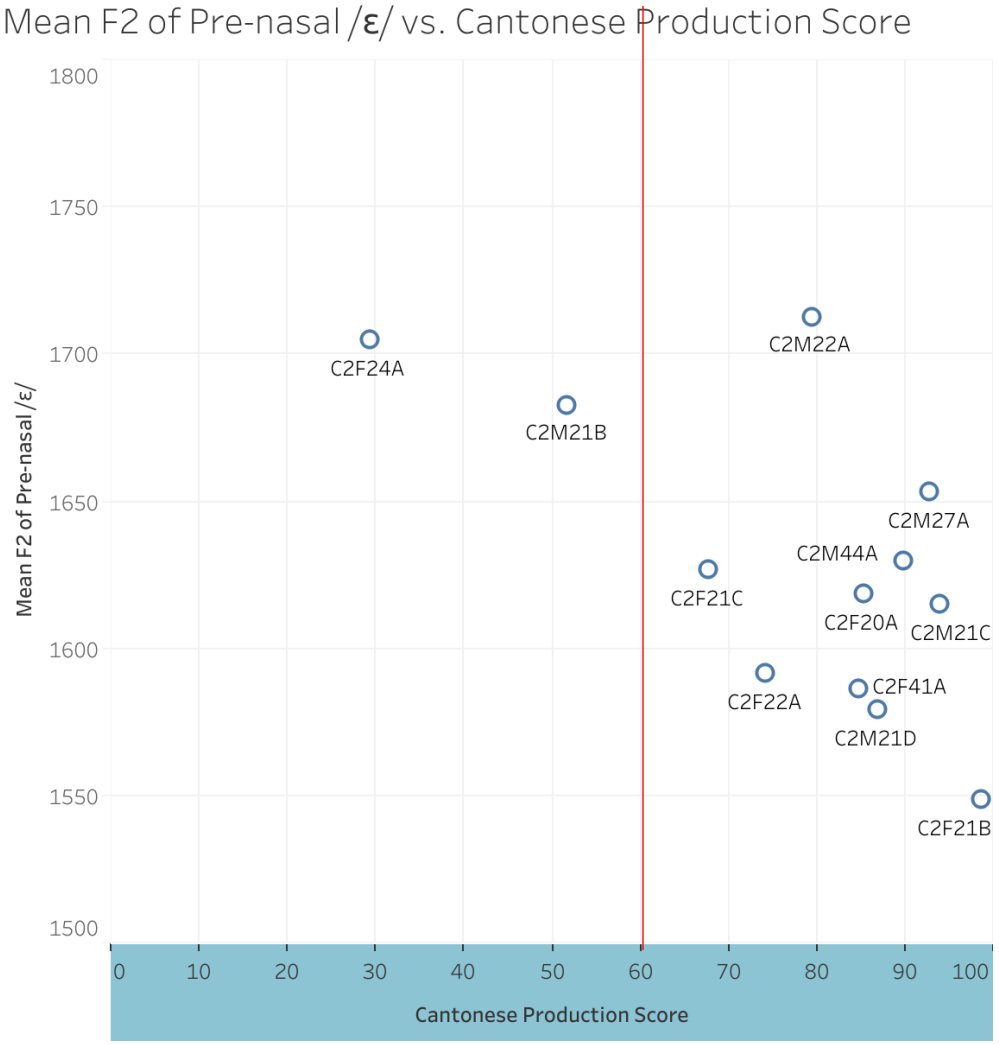
Interpretation: Contact argument strengthened

Results: Cantonese Production Score (CPS)

- CPS = (total words uttered in Cantonese + total words uttered in English) / total words uttered in transcription
  - Note: code-switching/mixing allowed in interviews, although interviews primarily in Cantonese

Best step-down model of /ɛ/ (GEN 2 data from pre-nasal context only) Random: Speaker and Word Fixed: CPS (p = 7.22e-02)***			
		Coefficient (Hz)	Tokens
continuous	+1	-161	258
r^2 [fixed] = 0.122, r^2 [random] = 0.373 , r^2 [total] = 0.495			

Lower CPS, More fronting of pre-nasal /ɛ/



Summary

- Does Toronto English influence lead to a contact-induced allophonic split in Cantonese /ɛ/? YES
  - Three sets of comparisons (Nagy 2011)
    - Are there inter-generational differences? YES
    - Do we find the same change in the Homeland variety (diatopic comparison)? NO
    - Is there a source structure (cross-linguistic comparison)? YES
  - Can we show greater likelihood of split based on Cantonese Production Score (a proficiency proxy)? YES, but more likely with lower CPS speakers
- What are the implications of these results for the internal/external dichotomy?

Discussion

- Muysken (2019) says new distinctions are more convincing than loss of features, but such cases seem lacking in studies discussed by Polinsky & Scontras (2019).
  - Results show a new allophonic distinction in a heritage language contact setting in North America
- Musken (2019) suggests it is higher proficiency speakers that initiate changes/deviations resulting in increased complexity such as allophonic splits
  - Results show the opposite -- lower proficiency (at least as evidenced in a proficiency proxy) speakers that are more likely to initiate these changes.
  - Seeds of change present as early as the second-generation, thus, long-term contact not needed
- Consistent with Labov's (2007, 2011) view that splits are L1-initiated
  - Results show this occurs even under early bilingualism
  - BUT split is contact-induced (Diffusion), possibly a result of intense lexical borrowing
- Deviation from monolingual baseline speakers (Polinsky & Scontras 2019)
  - Correct in showing lower proficiency speakers deviating more, but in this case deviation is about increasing complexity and NOT about simplification (at least in phonology)
    - Challenges a deficit perspective with a twist

Conclusion / Next Steps

- Contribute to a developing picture of how two phonological systems in contact interact with each other
  - Complexification vs simplification may be an oversimplistic way of discussing phonological systems in contact (see Tse resubmitted for an example of a merger led by the same speakers)
  - More research needed on this interaction to better understand the actuation of sound change in multilingual communities
- More data from the English spoken by GEN 2 Cantonese speakers
  - Is acoustic production of Cantonese pre-nasal /ɛ/ identical to English /æ/ in pre-nasal environment for other speakers with a split?
  - Is it clearly distinct for speakers lacking a split?
- Measure other acoustic features
  - Diphthongization?
  - Durational differences?
  - F0?

감사합니다 Дякую Grazie molto Спасибо 多謝 gratsiə namuor:ə

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HTTP://PROJECTS.CHASS.UTORONTO.CA/NGN/HLVC

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