The Role of Contact in Expanding Sound Inventories: Evidence from Toronto Heritage Cantonese

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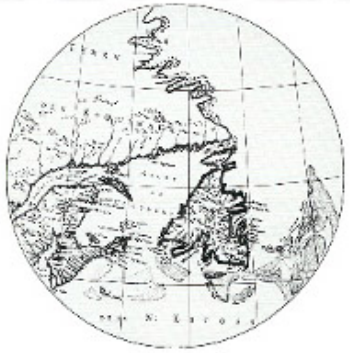

Atlantic Provinces Linguistic Association
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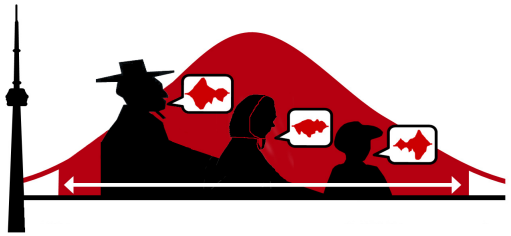

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A Historical Phonology Problem

"Most reports of phonemic change involve mergers: the reduction in phonemic inventory. This simple fact would lead to the odd conclusion that most languages are steadily reducing their vowel inventory. Since any overview of language history shows that this is not so, it stands to reason that just as many phonemic splits must take place as mergers. For reasons that are not entirely clear, it is not easy for students of the speech community to locate the ongoing creation of phonemic distinctions" (from Labov 1994:331, *Principles of Linguistic Change, Vol. 1*).

Documentation Problems

Coverage of Multilingual Communities in Variationist Sociolinguistics (Meyerhoff & Nagy 2008)

Journal	% of articles on more than one language
Language Variation & Change	11
Journal of Sociolinguistics	28

Coverage of English in Variationist Sociolinguistics (Nagy 2013)

Journal	% of articles focusing on English
Language Variation & Change	53
Journal of Sociolinguistics	62

- Research gaps in Variationist Sociolinguistics
  - Multilingualism
  - Languages other than English

Why not more cases of split?

- Proposal:
  - It's related to the under-documentation problem
- Related Questions:
  - Could they be more common in certain types of contact situations?
    - Example: Heritage Language Bilingualism vs. Monolingual community borrowing of loan words?
  - Could they be more common in languages other than English?
    - Example: Cantonese?

Phonemic splits discussed in PLC

Loss of conditioning factor

- Western PA English
  - /u/ and /ow/ front (except before coda /l/ and /r/
  - /l/ vocalization (loss of conditioning factor)
- Result
  - Too [ty] vs. tool [tuː]
  - Go [geu] vs. Goal [goː]

Internal Motivation

Borrowing

- /f/ ~ /v/ contrast in English through French loan words with /v/ (later other languages)

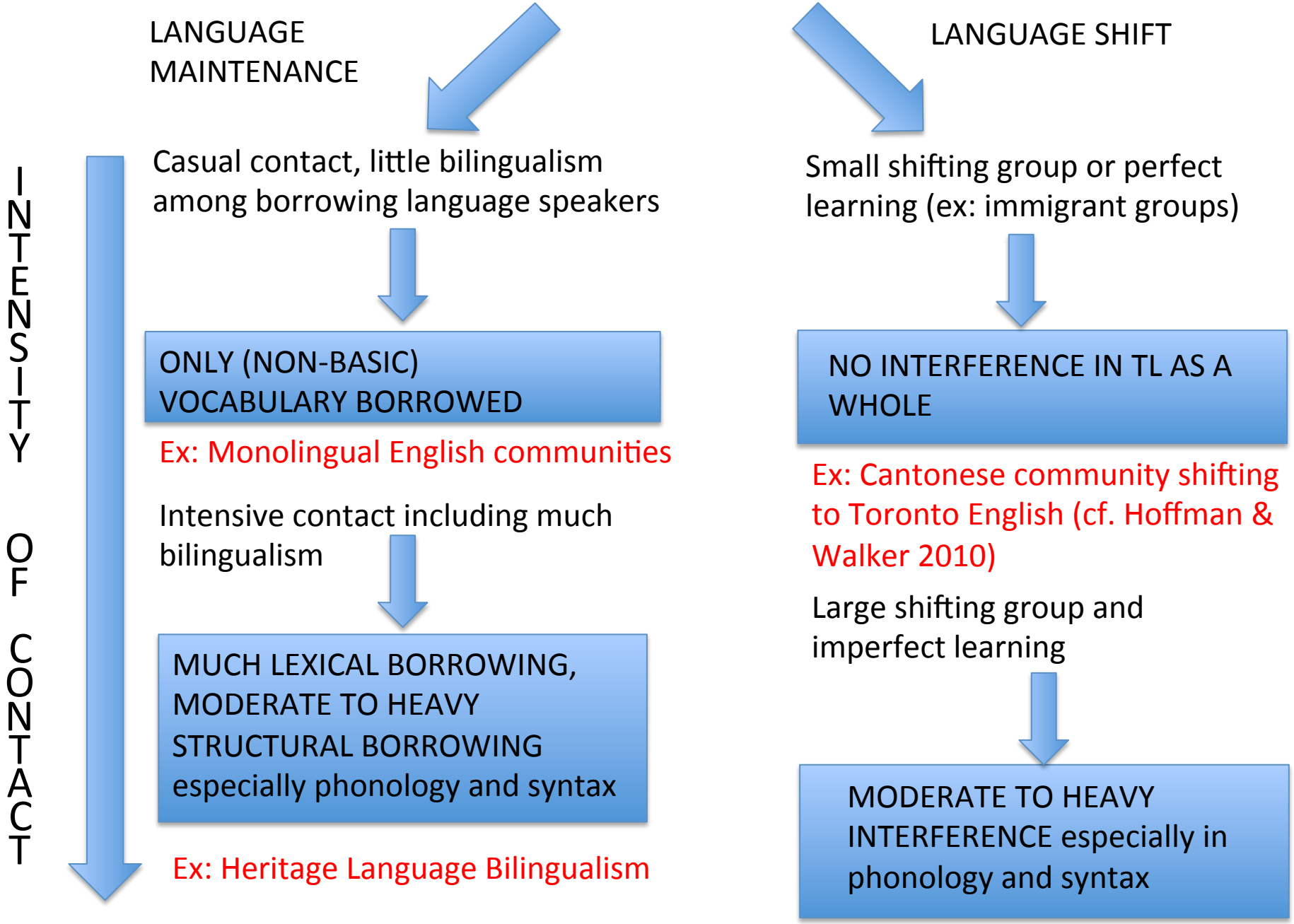
CONTACT!!!

Lexical Splits

- British Broad /a/
- Mid Atlantic Short /a/ split

Contact via dialect borrowing? Maybe, but debatable

Linguistic Results of Contact (from Thomason & Kaufman 1988)



Maintenance with Intense Contact

Phonological Interference

- Ronquest (2013): Transfer of English stress rules to HL Spanish
- Lyskawa et al (2015): Transfer of English constraints on final devoicing in HL Polish

Expanding Vowel Inventories

- Chang et al (2011): HL Mandarin-English bilinguals better at maintaining language-internal and cross-linguistic distinctions than L2 bilinguals
- Stewart (2014): Quechua (3 vowels) + Spanish (5 vowels) → 8 vowels with only partial overlap in Pijal Media Lengua (a bilingual mixed language)

Question

- Can we find evidence for the development of inventory size expansion in Toronto Heritage Cantonese?

HerLD Corpus

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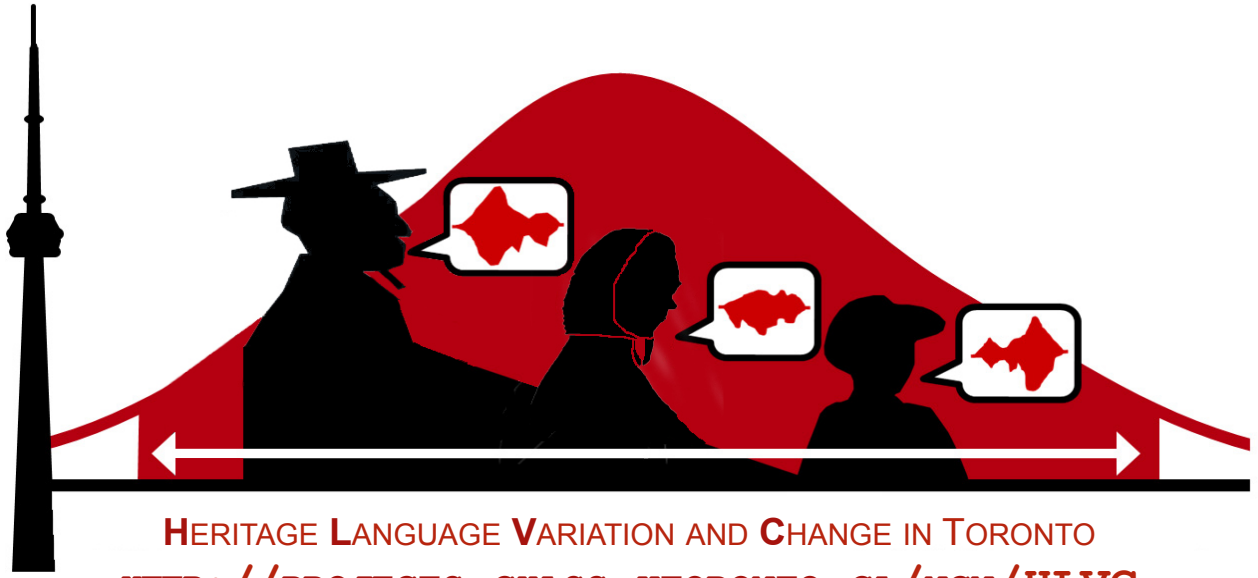
- HerLD = Heritage Language Documentation
- Product of Heritage Language Variation and Change (HLVC) in Toronto Project (Nagy 2011)
- Includes hour-long sociolinguistic interviews of the 2 generations of speakers that will be discussed



HERITAGE LANGUAGE VARIATION AND CHANGE IN TORONTO

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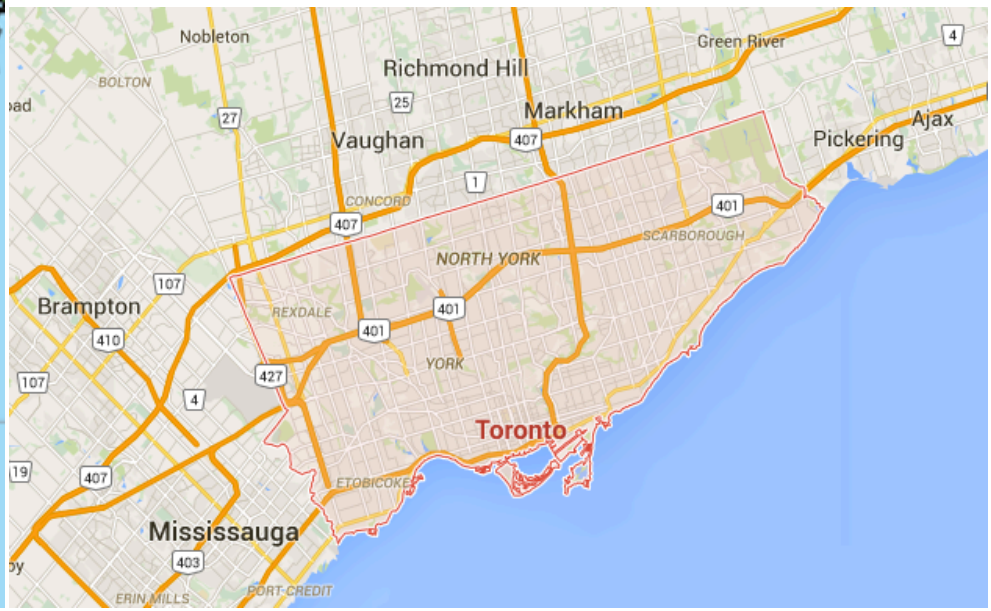
Cantonese (Yue, Sub-Family of Chinese)

- 62 million speakers worldwide (Ethnologue)



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- 52 million in Mainland China
- 5 million in HK (Homeland Variety)

- 5 million elsewhere in the Diaspora including Canada
- 178,000+ in Toronto, ON (Heritage Variety)

Contact Situation

GEN 1 Speakers

- Born and raised in HK, came to TO as adults, AND have lived in TO for > 20 years
- Variable levels of English proficiency (L2 bilinguals)

ENGLISH

+

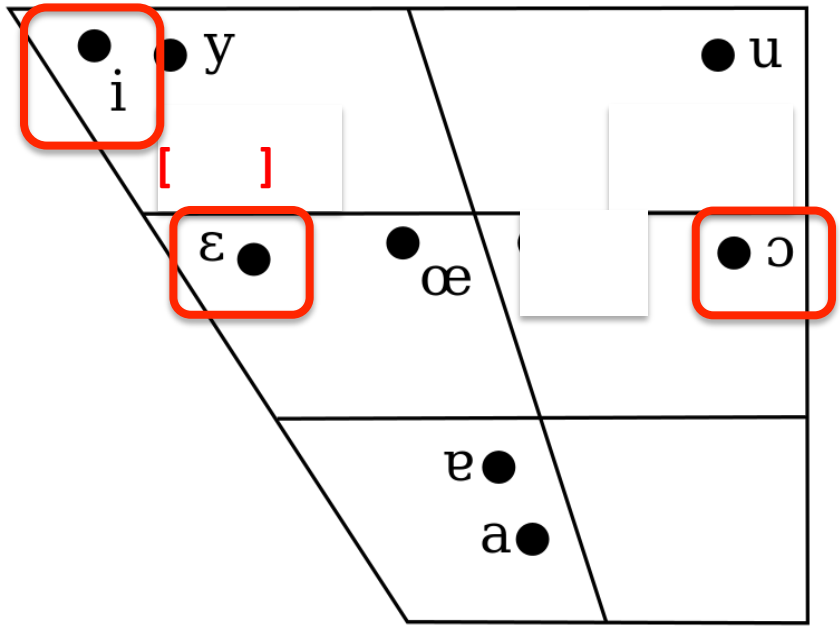
廣東話

Chinatown East (Riverdale) in Toronto, ON. Photo by Holman Tse, 2014

GEN 2 Speakers

- Grew up in TO
- Learned Cantonese primarily at home
- Universal knowledge of English (HL or early bilinguals)

Homeland Cantonese Vowels (Zee 1999)



Vowels	Examples (All in High Level Tone	Gloss
iː	si	'silk'
ɛː	t͡sɛ	'umbrella'
ɔː	sɔ	'comb'

8 contrastive monophthongs

Pre-velar Allophone

/iː/ → [ɪ] / __ k, ŋ

Example: /siːk/ → [sɪk] 'color, to know'

Speakers Examined

	Male	Female	
GEN 1	C1M46A C1M59A C1M61A C1M62A	C1F50A C1F54A C1F58A C1F78A C1F82A	N = 9
GEN 2	C2M21D C2M27A C2M44A	C2F16A C2F16B C2F16C C2F20A C2F21B	N = 8
	N = 7	N = 10	TOTAL N = 17

- Speaker Code indicates demographic info
- Primary criterium: audio quality

Token Distribution Per Speaker

Vowel (IPA)	Open syllable	Pre-velar	**Total**
/aː/	15	0	N = 15
/ɛː/	10	5	N = 15
/iː/	10	5	N = 15
/ɔː/	10	5	N = 15
/uː/	5	10	N = 15
	N = 50	N = 25	**TOTAL N = 75**

- 17 speakers X 5 vowels X 15 tokens = GRAND TOTAL = 1275 tokens
  - /aː/ and /uː/ included as point vowels for normalization
  - Watts & Fabricius Modified technique (Fabricius et al 2009)
- Two phonetic contexts: open syllable, pre-velar
  - uneven N due to low frequency for some vowel contexts
- Tone 1 (high-level) only except for /uː/ due to low frequency

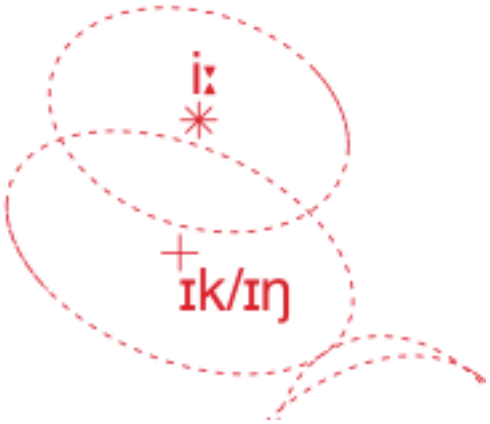
Brul (Johnson 2009)

		Independent Variables			
		Random Effects	Fixed Effects		
			Social Factors	Linguistic Factors	Factor Groups
Dependent Variables	F1	Speaker, Word	Generation, Sex, Age Preceding Segment, Following Velar		Generation:Sex:Velar
	F2				

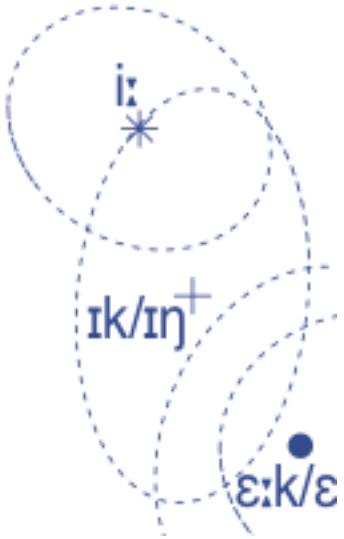
- Mixed Effects Modeling
- One-level analysis
- If significant, included Generation:Sex:Velar Factor Group
  - To determine how M and F speakers from each GEN group differ in production based on phonetic context

Results for /iː/

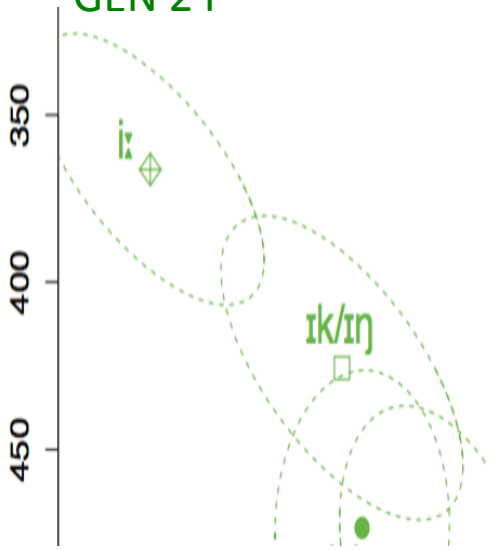
GEN 1 F



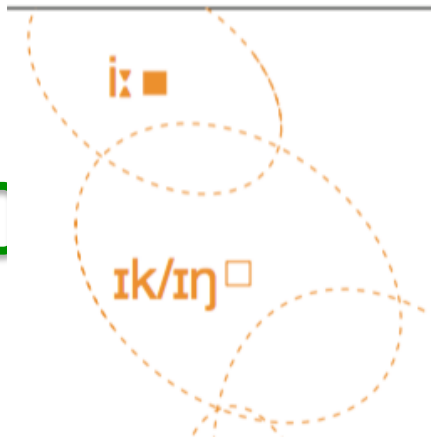
GEN 1 M



GEN 2 F



GEN 2 M

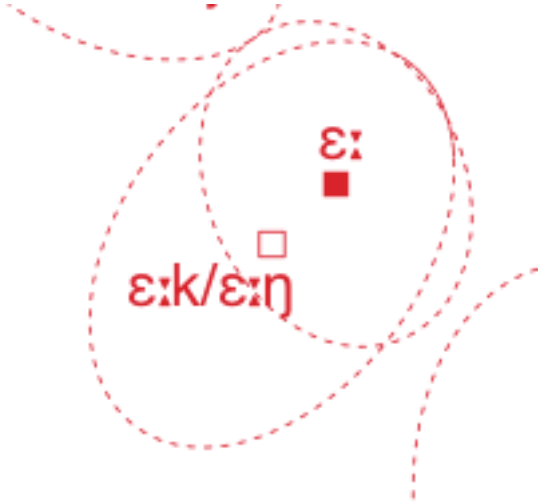


STEP UP AND STEP DOWN MATCH			
F1 for /iː/			
Best Step-Down Model, R2 [total] = 0.421			
Random Effects (R2 = 0.12)			
Speaker [random]			
Word [random]			
Fixed Effect (R2 = 0.301)			
Generation.Sex.Velar (0.000641)**			
factor	coef	N	mean Hz
2.F.[k/ŋ]	35	25	426
1.M.[k/ŋ]	31	20	417
1.F.[k/ŋ]	27	25	407
2.M.[k/ŋ]	3	15	391
1.M.[iː]	-14	35	372
1.F.[iː]	-15	45	369
2.F.[iː]	-18	50	366
2.M.[iː]	-49	30	336
Not Significant Factors			
Preceding			
Age			

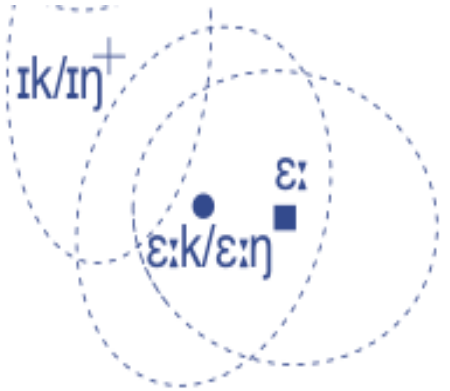
STEP UP AND STEP DOWN MATCH			
F2 for /iː/			
Best Step-Down Model, R2 [total] = 0.355			
Random Effects (R2 = 0.188)			
Speaker [random]			
Word [random]			
Fixed Effect (R2 = 0.167)			
Generation.Sex.Velar (1.9e-06)**			
factor	coef	N	mean Hz
2.F.[iː]	83	50	1969
2.M.[iː]	63	30	1948
2.M.[k/ŋ]	43	15	1876
1.M.[iː]	4	35	1890
1.F.[k/ŋ]	-17	25	1880
1.F.[iː]	-20	45	1864
1.M.[k/ŋ]	-29	20	1858
2.F.[k/ŋ]	-127	25	1712
Not Significant Factors			
Preceding			
Age			

Results for /ɛː/

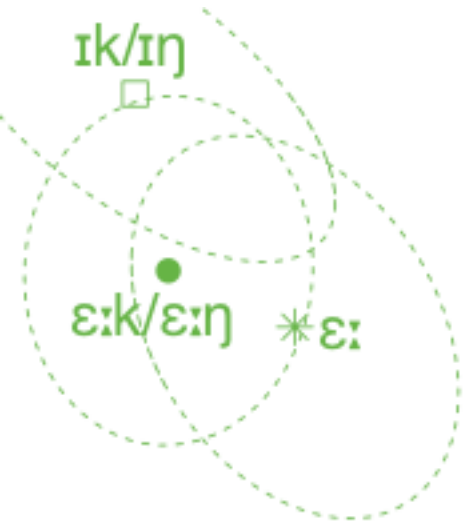
GEN 1 F



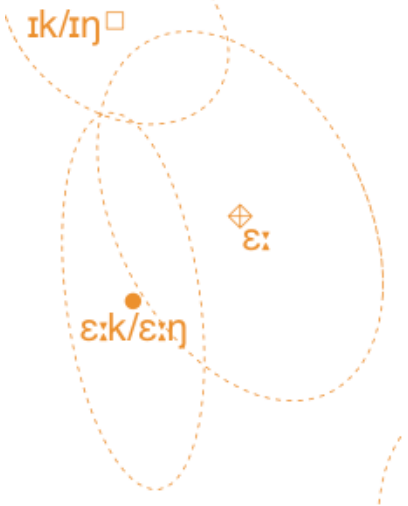
GEN 1 M



GEN 2 F



GEN 2 M



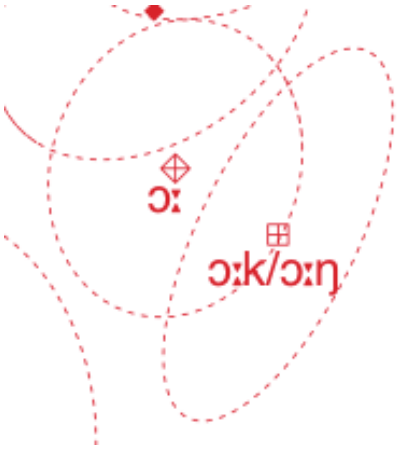
STEP UP AND STEP DOWN MATCH			
F1 for /ɛː/			
Best Step-Down Model, (R2 = 0.398)			
Random Effects (R2 = 0.307)			
Speaker [random]			
Word [random]			
Fixed Effects (R2 = 0.091)			
Generation.Sex.Velar (p = 0.0054)**			
factor	coef	N	mean Hz
2.M.[k/ŋ]	76	15	507
1.F.[k/ŋ]	24	25	489
2.F.[k/ŋ]	24	25	473
1.M.[k/ŋ]	10	20	457
2.F.[ɛː]	-11	50	489
2.M.[ɛː]	-29	30	472
1.F.[ɛː]	-43	50	473
1.M.[ɛː]	-51	40	460
Not Significant Factors			
Age			

STEP UP AND STEP DOWN MATCH			
F2 for /ɛː/			
Best Step-Down Model, (R2 = 0.575)			
Random Effects (R2 = 0.392)			
Speaker [random]			
Word [random]			
Fixed Effects (R2 = 0.183)			
Generation.Sex.Velar (p = 0.00598)**			
factor	coef	N	mean Hz
2.M.[k/ŋ]	94	15	1853
1.M.[k/ŋ]	27	20	1771
1.F.[ɛː]	24	50	1696
1.F.[k/ŋ]	23	25	1747
1.M.[ɛː]	21	40	1696
2.M.[ɛː]	15	30	1721
2.F.[k/ŋ]	-60	25	1685
2.F.[ɛː]	-143	50	1583
Not Significant Factors			
Age			

Results for /ɔː/

STEP UP AND STEP DOWN MATCH			
F1 for /ɔː/			
Best Step-Down Model (R2 total] = 0.263)			
Random Effects (R2 = 0.169)			
Speaker [random]			
Word [random]			
Fixed Effects (R2 = 0.094)			
Generation.Sex.Velar (p = 0.00317)**			
factor	coef	N	mean Hz
2.M.[k/ŋ]	29	15	520
1.M.[k/ŋ]	17	20	508
1.F.[k/ŋ]	11	25	502
1.M.[ɔː]	7	40	499
2.F.[k/ŋ]	-4	20	485
1.F.[ɔː]	-12	50	480
2.F.[ɔː]	-18	53	474
2.M.[ɔː]	-31	30	460
Not Significant Factors			
Age			
Preceding			

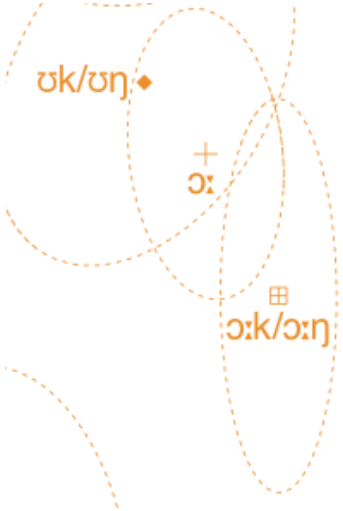
GEN 1 F



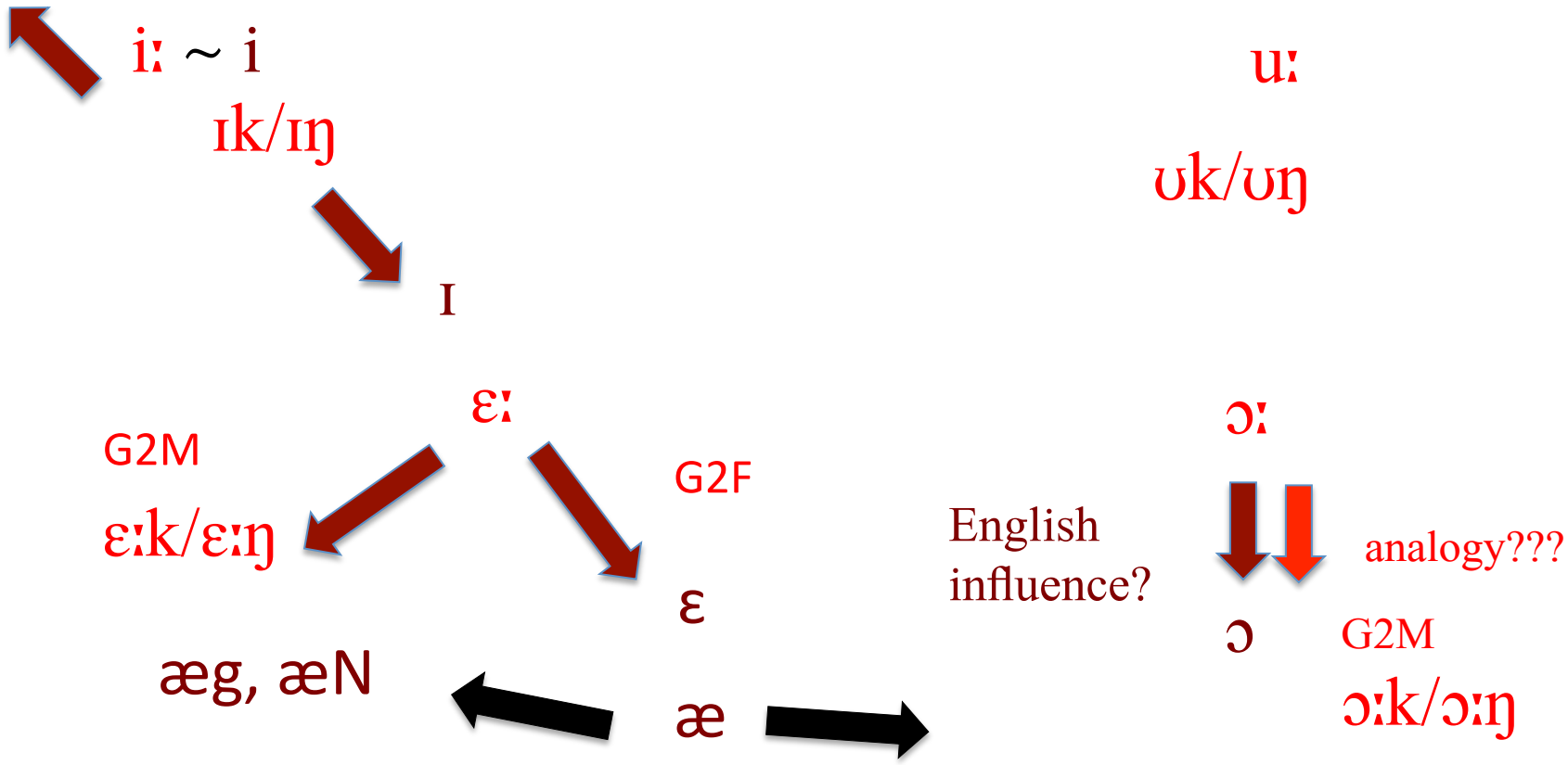
GEN 1 M

GEN 2 F

GEN 2 M



Analysis Based on Toronto English vs. Homeland Cantonese



Summary

- Allophonic variation in /i/ maintained BUT acoustic distance increasing
- Allophonic split innovated for /ɛ/
  - But in different ways
  - retraction in open-syllable (G2F)
  - fronting in pre-velar (G2M)
- Allophonic split innovated for /ɔ/ for G2M
- In sum, up to three allophonic splits

Discussion

- Early bilingualism means maintenance of language internal and cross-linguistic distinctions (Chang et al 2011)
  - → creates potential for overall expansion of sound inventory (Example: Media Lengua, cf. Stewart 2014)
- Evidence this may also apply to Toronto Heritage Cantonese under influence from English phonology
- Very few documented examples of splits in English dialects
  - But up to 3 examples in Toronto Heritage Cantonese!

Conclusion

- Supports Thomason & Kaufman's (1988) typology of contact-induced change
  - Phonological interference possible in HL contact situations, can have effects on vowel inventory size
- Only 3 out of 8 contrastive monophthongs in an under-researched (in the Variationist literature) variety examined … This is only the beginning
- Variation and change in HL vowels a promising avenue for future research …

감사합니다 Дякую Grazie molto Спасибо 多謝 gratsiə namuor:ə

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