Accents within accents: Voice quality in Merseyside speech

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1. Merseyside Background

- Liverpool English = low prestige variety [1, 2] spoken in Liverpool & surrounding areas, NW England [3].
- Said to have 'ousted' the traditional variety of the Wirral [4].
- Yet, 'different kinds of Merseyside Englishes' exist [5] with subtle phonetic distinctions between them [6, 7].
- Liverpool is urban with strong working class associations; Wirral more rural and affluent.
- Question: do 'plastic Scousers' from the Wirral distinguish themselves from Liverpool speakers phonetically?
- Here looked at in terms of laryngeal setting.

2. Voice Quality - Laryngeal Setting

- Laryngeal setting linked to social factors, e.g. gender, age & class [8, 9, 10, 11].
- In British English varieties, pre-aspiration & breathy voice more common in females [9, 10, 11, 12] ; pre-glottalisation & creak in males [9, 12, 13].
- Not just physiological: used in identity work & stance taking [14, 15].

What are pre-aspiration and pre-glottalisation?

Pre-aspiration:

- Turbulent airflow through glottis resulting in aspiration noise prior to stop closure [11, 12].
- Here: source-filter composite - glottal opening & supraglottal constriction [14] (ncludes pre-affrication).

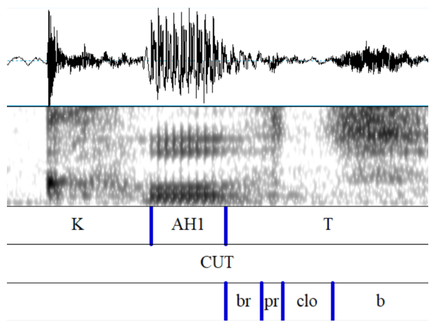
Pre-glottalisation (synonymous with 'glottalisation'):

- Creaky voice in the vowel terminus prior to stop closure [17, 18].

3. Methods

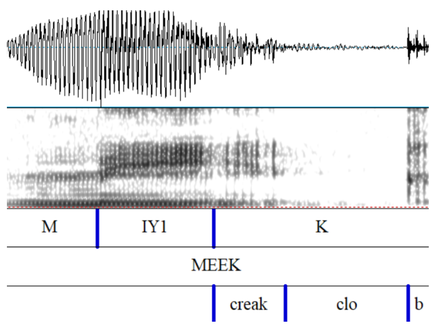
- 16 people in final year of 6th form from across the Wirral and Liverpool tested.
- Participants read wordlist twice: 24 CVC words incl. coda /t/, 23 coda /k/ (x2).
- Praat textgrids created [19]. Auto-aligned in FAVE [20].
- **Pre-aspiration and pre-glottalisation (creak) manually annotated. Coded for presence vs absence.**

	Location			
	Liverpool		Wirral	
Sex	Male	Female	Male	Female
Number	3	6	3	4



Waveform and spectrogram showing a pre-aspirated production of 'cut' by Wirral male, WM3. 'br' = breathy voice, evident through the appearance of low intensity formants and a sinusoidal waveform structure. 'pre' = pre-aspiration*, visible as a portion of friction noise.

*Due to duration, only the 'pr' of 'pre' is showing



Waveform and spectrogram depicting a pre-glottalised production of the word 'meek' by Wirral female, WF2. 'creak' = creaky voice, visible in the waveform and spectrogram as irregular glottal pulsing.

- Band Pass Filtered Zero Crossing Rate (**BP ZCR**) **also obtained** (using script provided by Olga Gordeeva) = no. times per sec signal passes through zero.
- Previously applied to breathy voice and pre-aspiration [11, 16, 21]. Higher BP ZCR, noisier signal.
- If pre-aspiration/pre-glottalisation present, vowel endpoint set as endpoint of laryngeal phenomenon.
- Vowels preceding /t/ and /k/ divided into 5 points. Mean BP ZCR in final 5th of vowel examined.

4. Results

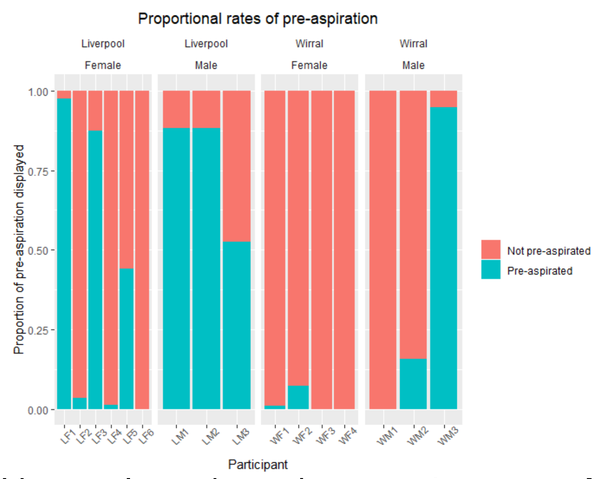
Presence versus absence of pre-aspiration and pre-glottalisation

Model:
- Generalised Linear Mixed

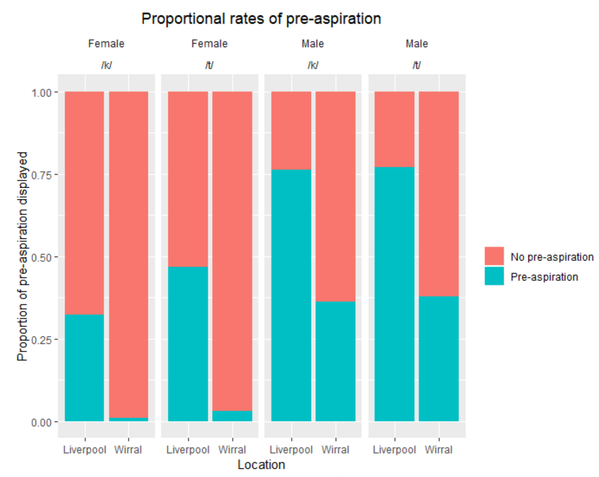
Dependent Variables:
- Presence vs absence of 1) pre-aspiration and 2) pre-glottalisation.

Fixed Effects	Dependent Variable			
	Pre-aspiration		Pre-glottalisation	
	z value	p value	z value	p value
Location	-2.113	0.0268*	3.199	0.00138**
Sex	-2.214	0.0103*	-3.561	<0.001***
Plosive	2.567	<0.001***	-4.474	<0.001***
Sex*Plosive	-4.876	<0.001***	4.137	<0.001***
Random Effects	Participant		Vowel	

GLMER summary of statistics



Liverpool speakers show greater use of pre-aspiration than Wirral speakers.

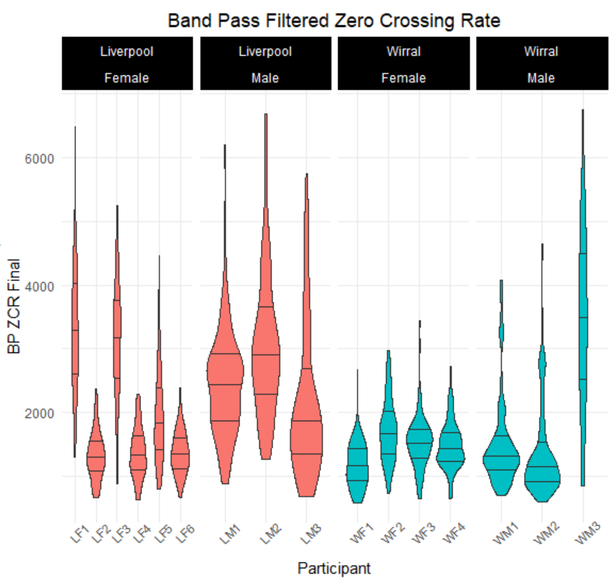


Males show greater rates of pre-aspiration than females. Overall, /t/ shows greater pre-aspiration than /k/.

Wirral speakers show greater use of pre-glottalisation (creak) than Liverpool speakers.

Females show greater rates of creak than males. Overall, /k/ shows greater pre-glottalisation than /t/.

BP ZCR



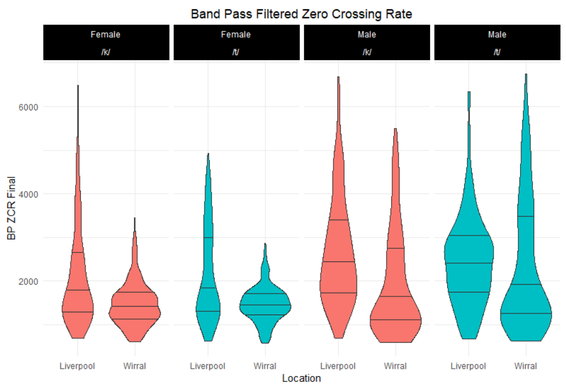
Above: violin plot showing BP ZCR for each participant, sorted by location and sex.
Right: BP ZCR for each location, sorted by sex and plosive.
Both: horizontal lines indicate interquartile range.

Model:
- Linear Mixed Effects

Dependent Variable:
- BP ZCR in final fifth of the vowel.

Fixed Effects:
- Location, gender and plosive

* Plosive significant (F(1, 1421), p=0.006**) -- location and gender not.



5. Conclusions

- Liverpool and Wirral speakers differed in rates of pre-aspiration and pre-glottalisation displayed.
- Pre-aspiration more common in Liverpool speakers; pre-glottalisation more common in Wirral speakers.
- **But,** high levels of individual variation shown.
- In the acoustic measure, BP ZCR, location differences were not significant (despite graphical similarity between proportional rates of pre-aspiration & BP ZCR).

REFERENCES

[1] Coupland, N. & Bishop, H. (2007). Ideologised values for British accents. *Journal of Sociolinguistics, 11*, 74-93.
[2] Montgomery, C. (2007). *Northern English dialects: a perceptual approach* (Unpublished doctoral dissertation). University of Sheffield, Sheffield.
[3] Marotta, G. & Barth, M. (2006). Acoustic and sociolinguistic aspects of lenition in Liverpool English. *Studi Linguistici e Filologici Online* (www.humnet.unipi.it/slifo/), 377-413.
[4] Knowles, G. (1973). *Scouse: the urban dialect of Liverpool* (Unpublished doctoral dissertation). University of Leeds: Leeds.
[5] Grant, A. (2007). Looking (literally) at Liverpool English: Thoughts on the popular (and less popular) documentation of Scouse lexicon. In A. Grant, & C. Grey (Eds.), *The Mersey sound: Liverpool's language, people and places* (pp. 141-163). Liverpool: Open House Press.
[6] West, H.F. (2015). Language attitudes and divergence on the Merseyside/Lancashire border. In R. Hickey (Ed.), *Researching Northern English* (pp. 317-341). Amsterdam: John Benjamins.
[7] Clark, L. & Watson, K. (2016). Phonological leveling, diffusion, and divergence: */t/* lenition in Liverpool and its hinterland. *Language Variation and Change, 28*, 31-62.
[8] Esling, J. (1978). The identification of features of voice quality in social groups. *Journal of the International Phonetic Association, 8*, 18-23.
[9] Stuart-Smith, J. (1999). Glasgow: Accent and voice quality. In P. Foulkes & G. Docherty (eds.), *Urban voices: Accent studies in the British Isles* (pp. 201-222). London: Arnold.
[10] Hejná, M. (2015). *Pre-aspiration in Welsh English: A case study of Aberystwyth* (Unpublished doctoral dissertation). University of Manchester: Manchester.
[11] Morris, J., & Hejná, M. (2019). Pre-aspiration in Bethesda Welsh: A sociophonetic analysis. *Journal of the International Phonetic Association*, 1-25.
[12] Foulkes, P., Docherty, G., & Watt, D. (2001). The emergence of structured variation. *University of Pennsylvania Working Papers in Linguistics 3*(7), 67-84.
[13] Henton, C.G., & Bladon, R.A.W. (1985). *Breathiness in normal female speech: inefficiency versus desirability. Language & Communication, 5*(3), 221-227.
[14] Levon E. (2016). Conflicted selves: language, religion, and same-sex desire in Israel. In E. Levon, and R.B. Mendes (Eds.), *Language, Sexuality and Power: Studies in Intersectional Linguistics* (pp. 215-239). New York: Oxford University Press.
[15] Podesva, R.J., & Callier, P. (2015). Voice quality and identity. *Annual Review of Applied Linguistics, 35*, 173-194.
[16] Gordeeva, O B. & Scobbie, J.M. (2010). Preaspiration as a correlate of word-final voice in Scottish English fricatives. In S. Fuchs, M. Toda, & C. Żygis (Eds.), *Turbulent sounds: An interdisciplinary guide* (pp.167-208). Berlin: De Gruyter Mouton.
[17] Chong, A.J., & Garellek, M. (2018). Online perception of glottalized coda stops in American English. *Laboratory Phonology: Journal of the Association for Laboratory Phonology, 9*(1), 1-24.
[18] Penney, J., Cox, F., Miles, K., & Palethorpe, S. (2018). Glottalisation as a cue to coda consonant voicing in Australian English. *Journal of Phonetics, 66*, 161-184.
[19] Boersma, P. and Weenink, D. (2019). "Praat: doing phonetics by computer [Computer program]. Version 6.0.48, http://www.praat.org/
[20] Rosenfelder, I., Fruehwald, J., Evanini, K., Seyfarth, S., Gorman, K., Prichard, H., & Yuan, J. (2014). FAVE (Forced Alignment and Vowel Extraction) Program Suite v1.2.2. DOI: https://doi. org/10.5281/zenodo, 22281.
[21] Nance, C., & Stuart-Smith, J. (2013). Pre-aspiration and post-aspiration in Scottish Gaelic stop consonants. *Journal of the International Phonetic Association, 43*(2), 129-152.

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