

Tracking the timecourse of perception: Ambiguous rhoticity in Glasgow

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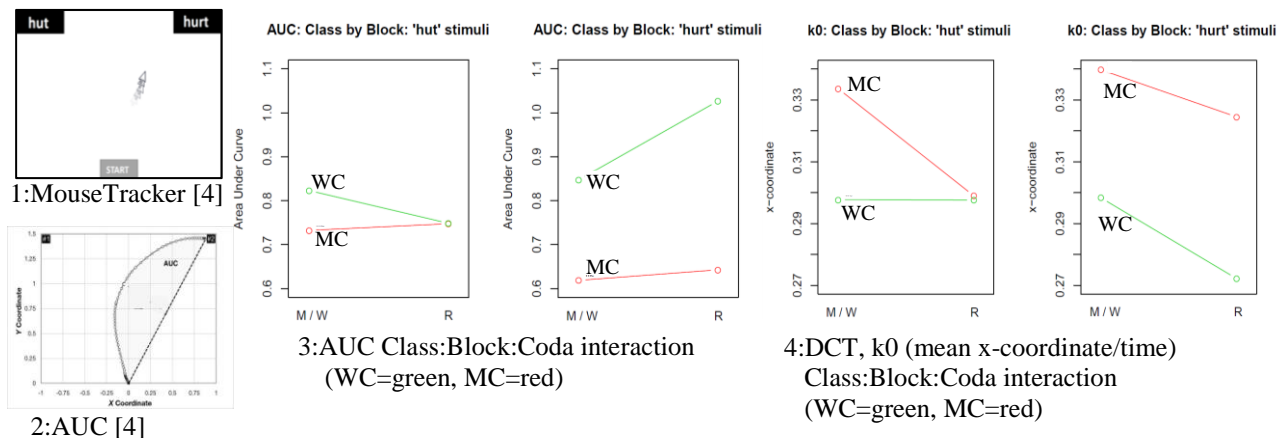
Working class (WC) Glaswegian speech is losing postvocalic /r/ [1], while middle class (MC) rhoticity strengthens [2]. WC minimal pairs like *hut/hurt* can be misperceived, as the pharyngealized /r/ is acoustically [2] and perceptually [3] similar to the preceding vowel. Misperception decreases as long-term experience of Glaswegian increases, and short-term exposure promotes perceptual change [3]. This paper uses mouse tracking [4] to investigate the timecourse of perception as the word unfolds, recording cursor trajectories as participants move the mouse to select e.g. 'hut' or 'hurt' (Fig.1). Trajectory analyses quantify spatial attraction to competitors (Area-Under-the-Curve: AUC, Fig.2 [4]), and curve properties (Discrete Cosine Transforms: DCT [5]).

51 Glaswegians heard 192 stimuli (1xMC and 1xWC Glasgow males) in 3 blocks (MCblock&WCblock alternated their presentation order by participant):

- 1.MCblock: 24xMC (e.g. *hut/hurt*) + 24xMC distractors (e.g. *meek/make*)
- 2.WCblock: 24xWC + 24xWC distractors
- 3.Rblock: All stimuli from MC&WCblocks, Randomised together.

Using lme4 & lmerTest's step() to refine saturated mixed-effects-models in R, the best-fitting AUC model contained the 3-way-interaction of Class:Block:Coda (Coda=whether stimulus canonically has an /r/) ($\text{Pr}(> F) = 0.01$, $F = 6.02$) (Fig.3). Trajectories for WC *hurt* stimuli in the Rblock had the largest AUC (i.e. largest spatial attraction to competitor), suggesting that they were hardest to distinguish from *hut*.

The best DCT model for k0 (mean-x-coordinate/time) also contained Class:Block:Coda ($\text{Pr}(> F) = 0.004$, $F = 8.51$) (Fig.4). With the lowest mean-x-coordinate/time (i.e. latest movement towards correct response), WC *hurt* stimuli were again hardest. Furthermore, all MC stimuli were harder to distinguish when randomised with WC stimuli (Rblock), suggesting a similar finding as [6], highlighting the difficulty of perceptually switching between different speakers with different accents.



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