

## **A dynamic perspective on sociophonetic variability in the realisation of vowels in Australian English**

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This paper reports findings from a study of the dynamic properties of vowel formant trajectories, focusing on how they shed light on sociophonetic differences. Our data are drawn from recordings of conversational speech produced by speakers of English from Perth, Western Australia.

The corpus comprises 40\*30 minute conversations between same-sex pairs of speakers aged 18-22, equally divided by sex and neighbourhood (half having grown up in the top decile of the SES neighbourhood ranking and half in other neighbourhoods). Acoustic analysis was undertaken on all vowel phonemes, to test the hypothesis that sex and neighbourhood would be relevant factors in accounting for patterns of vowel realisation.

The analysis applied mixed effects modelling to contrast three methods for capturing vowel realisation: (a) a 'target' analysis based on a single representative measurement point for each token, as conventionally used within the literature on vowel variation and change; (b) a dynamic analysis in which a mixed-effects model was fitted to the middle 80% of the formant trajectories, to examine how the predicted trajectories vary across the neighbourhood condition, taking into account the effect of speaker sex as a fixed factor; for (c), polynomial terms were added to the dynamic mixed effects analysis to analyse trajectory curvature, with fixed and random factors configured as in (b).

The paper will report the findings for the full dataset of 40 speakers. Our initial analysis of a subset of 18 speakers suggests that both (b) and (c) yield differences as a function of sex and/or neighbourhood which are not apparent from the target analysis. Results from (c) with the quadratic terms point to sociophonetic variegation arising from differences in the internal dynamics of formant trajectories. The theoretical implications of the findings are discussed alongside issues relating to the deployment of dynamic analysis methods with conversational speech material.

[300 words]