Objective

The goal of this study is to model geographic variation of UK pronunciation based on the pronunciation of the vowel /æt/. Thousands of tokens of the vowel in the word ‘five’ were mined from the Audio British National Corpus and compared across seventeen regions of the UK. This study was designed with an expectation of a spectrum of dialects existing across the country with monophthongal realizations (/i/ as in ‘feive’) primarily found in the North, i.e., some Scottish varieties, and more diphthongization (/æt/ as in ‘five’) occurring in the South.

Methodology

Data Mining
• 8,567 tokens of ‘five’ were retrieved from the BNC.
• “Bad data” was excluded (whispery, overlapping, or exceptionally high-pitched speech), yielding 1,773 tokens to manually trim and analyze.

Functional Data Analysis (see fig. 1)
• Orthogonal cubic polynomials were fitted to each F1 and F2 track.
• Tokens with slopes that lined up with expectations (falling F1 and rising F2 values) were included in the study, yielding 1,049 tokens total.

Modal Analysis (see fig. 2)
• Speaker medians for each word were binned and then modally plotted in increments of 50 Hz for F1 Max and 100 Hz for F2 Min.
• Distinct areas of high vowel quality concentration suggest that our dataset of /æt/ F1 Max and F2 Min values is bimodal.

Geographic Analysis (see figs. 3, 4)
• Distance from Orkney (northernmost location) was established as an independent variable.
• For each location, median geographic coordinates were loaded, and Distance from Orkney calculated.
• A correlation was found between Distance from Orkney and F2 Min.

Acknowledgements

This project was made possible by the University of Georgia’s Center for Undergraduate Research Opportunities summer fellowship and the Oxford University Phonetics Laboratory. I would also like to thank mentors Prof. John Coleman and Dr. William A. Kretzschmar, along with GIS librarian Meagan Duever, who dedicated their time and expertise to this project.

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