THE GAZETTEER OF SOUTHERN VOWELS

The Linguistic Atlas of the Gulf States (LAGS) is a collection of archival recordings of interviews with 1121 speakers across the southern United States (Pederson, McDaniel & Adams 1986) which has been digitized by the Linguistic Atlas Project at the University of Georgia. The Digital Archive of Southern Speech (DASS) is a 64-speaker subset of LAGS, compiled by Lee Pedersen, that was designed to be socially balanced across 16 sectors of the South (Kretzschmar Jr. *et al.* 2013). DASS is currently being transcribed, processed, and analyzed at the University of Georgia (Olsen *et al.* forthcoming), and vowel formant measurements from over half of the audio have been automatically extracted.

This paper introduces the *Gazetteer of Southern Vowels* (GSV), a web interface that permits users to interact with and visualize the formant measurements extracted from DASS (available at http://lap3.libs.uga.edu/u/jstanley/vowelcharts/). Built in Shiny, a web application framework for R (shiny.rstudio.com), this site combines the powerful data analysis and visualization capabilities of the R programming language—even on devices that do not or cannot run R—with the interactivity of a website.

Currently, GSV has several ways of visualizing vowel data:
- The ***Vowel Plot Comparison*** page displays individual vowel tokens in F1, F2 space, allowing users to compare speakers, groups, or portions of the vowel system.
- The ***Interactive Vowel Plot*** page allows a more focused view of the data and features a single large plot that reacts to mouse clicks (or taps, on mobile devices) with accompanying tables that are populated with data summaries corresponding to the vowel tokens displayed.
- The ***Point Pattern Analysis*** page overlays a grid in the vowel space and, in a chart below, plots the distribution of data in these cells in order of frequency.

On each page, the user controls what portion of DASS is displayed and how it is displayed using an interface that includes:
- filters for speakers based on demographic factors including sex, age, ethnicity, state, education, and social class;
- selecting subsets of vowels and filtering by place, manner, and voicing of the following segment;
- options for displaying points, text, ellipses, and/or mean values, each with its own set of visual controls;
- a variety of normalization procedures and transcription systems.

As an illustration of GSV's utility, we use DASS data to confirm various known features of Southern English. For example, we show that the beginning stages of the Southern Vowel Shift (Feagin 2003) are more advanced in younger speakers (born after WWI) than older speakers (born before WWI); that back vowel fronting is more advanced for Caucasian Americans than for African Americans (Thomas 2007); and that some states have the FEEL-FILL, FAIL-FELL, and PULL-POLE mergers while others do not (Labov, Ash & Boberg 2006).

The GSV site makes the acoustic output of DASS freely available for visualization and analysis, allowing researchers to draw conclusions about this portion of the Linguistic Atlas of the Gulf States faster and easier than ever before, while producing high-quality, downloadable visualizations.

References

Feagin, Crawford. 2003. Vowel shifting in the southern states. In Stephen J. Nagle & Sara L. Sanders (eds.), *English in the Southern United States*, 126–140. (Studies in English Language). Cambridge: Cambridge University Press.

Kretzschmar Jr., William A., Paulina Bounds, Jacqueline Hettel, Lee Pederson, Ilkka Jusso, Lisa Lena Opas-Hänninen & Tapio Seppänen. 2013. The Digital Archive of Southern Speech (DASS). *Southern Journal of Linguistics* 27(2). 17–38.

Labov, William, Sharon Ash & Charles Boberg. 2006. *The Atlas of North American English: Phonetics, Phonology and Sound Change*. Walter de Gruyter.

Olsen, Rachel, Michael Olsen, Joseph A. Stanley, Margaret E. L. Renwick & William A. Kretzschmar Jr. Forthcoming. Methods for transcription and forced alignment of a legacy speech corpus.

Pederson, Lee, Susan L. McDaniel & Carol M. Adams. 1986. *Linguistic Atlas of the Gulf States*. 7 vols. Athens, Georgia: University of Georgia Press.

Thomas, Erik R. 2007. Phonological and phonetic characteristics of African American vernacular English. *Language and Linguistics Compass* 1(5). 450–475.