Traditionally, variables in regional dialectology and variationist analysis have been analyzed one variable at a time. This practice allows researchers to carefully consider both linguistic and social factors for individual variables, but it leaves open many questions about cross-variable comparisons (Bayley & Lucas 2007). As proponents of third-wave variationist analysis have argued, variables analyzed in isolation do not readily reveal their social meanings for, nor appropriately characterize, speakers, since speakers employ variables in concert with each other (Moore 2010).

This paper employs completed studies of 10 sociolinguistic variables to determine how speakers coordinate their cross-variable patterns. It encompasses more than 31,000 tokens collected from 67 speakers in the West Virginia region of Appalachia. Four of the 10 variables were assessed with basic counts, including *a*-prefixing (*We were a*-walking), perfective *done* (*I done did the dishes*), for-to infinitives (*I want for you to leave*), and pleonastic pronouns (*My sister, she’s a nurse*). Five factors were examined with the traditional model of the linguistic variable, including (ING) (*walk[n]/[ŋ]*)), demonstrative *them* (*But them girls like him*), coronal stop deletion (CSD) (*best/ bes’*), leveled *was* (*We was out late*), and quotative *like* (*She was like, “Hell yeah!”*). One parameter, *L*-vocalization (*coal [ko:]*), was analyzed acoustically. All 10 variables are part of the cross-variable analysis for the speakers, and the five traditional tokens are evaluated using principle component analysis. The results are then compared speaker-by-speaker with the other variables.

This extended study provides the opportunity to determine whether sociolinguistic variables pattern similarly across speakers. The first hypothesis was that variables with a greater range of rates between speakers would cluster together and that those with a smaller range of rates would cluster together. The results show that variables are more directed by social factors in their distribution amongst speakers. Socially important parameters, such as alveolar (ING) and leveled *was*, cluster together in their variable patterns, while less stigmatized variables, such as CSD, appear to be more randomly distributed with a narrower range. The second hypothesis was that social factors would be the clearest groupings. Results show that only a few social factors, such as age, form significant groupings. The binary category of sex did not yield identifiable sets of speakers, demonstrating the lack of explanatory power of the category.

One benefit of this cross-variable analysis method is that the social categories formed *a priori* can be reconfigured based on observable distinctions. This approach also provides a retrospective analysis of the methods used in traditional sociolinguistic studies, thereby potentially improving future data analysis, and maximizing research efficiency in the face of increasingly limited funding. In addition, this analysis will enhance sociolinguistic revisions of Dialect Density Measures for sociolinguistic and educational goals, including ones specifically tuned to trends in Appalachia to complement those used for AAVE (Renn & Terry 2009). This improved DDM will be part of educational outreach programs set to launch in 2015.