The primary goal of this analysis is to determine the functional connectivity associated with performance on a speech performance task. The behavioral data for this analysis requires an additional consideration given the nature of speech entrainment.

Speech entrainment is a task proven to improve fluency in individuals with nonfluent aphasia. During the task, IWA are instructed to watch and listen to a video of a human mouth producing a pre-recorded script(novel to the participant). The participant is asked “to mimic” the speaker to the best of their ability. This task is conducted three times with three different scripts, each controlled for length and number of words. The participant’s productions are then transcribed and scored for a myriad of lexical, grammatical and syntactical errors. In addition to the speech entrainment tasks, individuals are asked to complete three picture descriptions in which they are prompted to, “Tell everything you see in the picture and do your best to use full sentences.” The picture description transcripts are scored in a manner consistent with the speech entrainment trials. Independent scores for each of the three picture description and the three speech entrainment tasks are averaged to yield a series of behavioral scores that represent the participant’s performance for SE and spontaneous speech.

To determine which individuals benefit from speech entrainment (typically those with nonfluent aphasia), the picture description and speech entrainment scores are considered in a ratio of SD/PD. Scores of greater than 1 indicate improved performance with the speech entrainment versus performance in the spontaneous speech (picture description task). To control for participants who are unable to independently produce verbal output in the picture description task, 0.5 was added to each score so calculations did not divide by zero.

Consistent with NiiStat analyses, I set up an excel sheet with Columns of participant codes, SE/PD ratios and Western Aphasia Battery Aphasia Quotient (WAB-R). I included WAB-R to use as a covariate and to determine how type and severity of aphasia affected associations with functional connectivity and speech entrainment success. I labeled the excel sheet “NiiStat.” I began my analyses by using Bonferroni to correct for multiple comparisons and did not control for lesion size. I set the overlap (minimum # of participants). I selected the JHU and AICHA atlases for my initial analyses to determine how lesion location was associated with speech entrainment performance. Initial analyses yield the following results:

To determine associations with functional connectivity and speech entrainment I used the following script to determine which .mat files contained resting state data:

[include cbf script]

Furthermore, to review additional components of the scans, I can use load ‘M\*\*\*\*.mat’ to determine the contents of the existing .mat files. This is help to guide future analysis or trouble shoot when existing .mat files do not contain structures for specific protocols and atlases (ie resting state and AICHA).

In the current set of data I encountered 9 participants who were scanned with a protocol that differed from the remainder of the group. These same 9 participants did not have behavioral data so they were not included in the analysis. Had these participants had relevant behavioral data, I would have included the scans from the second protocol as a nuisance regressor. To do this in NiiStat, I would have used a Freeman Lane and would have included this variable in the last column of the excel sheet.