

8/29/20

Update to *Intra- and inter-subject variability in pattern reversal visual evoked potentials in a pediatric population determined by principal component analysis.*

**PCA model generation:** The principal component analysis model will be trained using 20 females and 20 males in the control subject group. Subjects who have a prior history of concussion or migraine will not be excluded for model fitting. VEP response will be obtained by taking the mean across the first two sessions recorded for each subject. This model will be tested using 40 age- and sex-matched subjects. Specifically, PC scores for the highest variability PCs containing >95% of the variability in the data will be compared in the train and test groups using two-tailed two-sample t-test.

**Determining reliability across sessions:** Reliability across sessions will be determined for the 40 train subjects and the 40 test subjects. Specifically, PC scores will be derived for each session from the PCA model. Pearson correlation coefficient will be calculated for session 1 and session 2 in the train and test groups.

**Model fitting to control subjects:** PCA model fitting will be done for all control subjects. If PC scores are reliable across sessions (>0.7 Pearson correlation coefficient), VEP response across all available sessions (between 1 and 4 sessions are available for all control subjects generally) will be used to determine the mean VEP response for each subject. PC scores will be calculated from the mean VEP response for each subject.

**Subgroup analysis:**

*Age comparison:* Pearson correlation coefficients will be calculated for PC scores as a function of age.

*Sex comparison:* PC scores for male and female subjects will be compared using a two-tailed two-sample t-test.

*Chronic headaches:* subjects with a personal history of migraine or chronic headaches will be compared to subjects without such a history using a two-tailed two-sample t-test. This analysis will also be expanded to include those with a family history of migraine or chronic headaches.

*Concussion:* Subjects with a prior history of concussion will be compared to subjects without subj a history using a two-tailed two-sample t-test.

**Data representation:** All mean VEP responses will be presented with 95% confidence intervals based on bootstrap analysis.