# 2021 Gatlinburg Conference Poster Submission

**EXAMPLE**

**Title**: Neural Correlates of Audiovisual Multisensory Integration in Youth with and without Autism

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**Introduction**: Individuals with autism frequently present with difficulties in processing audiovisual information. Audiovisual integration in individuals with ASD has been frequently assessed via the temporal binding window (TBW; i.e., the period of time over which individuals combine incongruent auditory and visual information). Individuals with autism are frequently noted to have enlarged TBWs compared to non-autistic, otherwise typically developing peers, which may lead to difficulty understanding events in the natural world. Despite research elucidating the neural substrates underlying TBWs in non-autistic adults, no study to our knowledge has investigated the neural substrates of TBWs in children with and without autism. The present study represents an important initiation into the investigation of neural correlates of atypical TBWs in children with and without autism by addressing the following research question: do youth with autism differ in neural indices of decision making during a simultaneously judgment task compared to non-autistic peers (i.e., is there a group difference in the P3 wave form).

**Method**: Forty participants (25 with autism, 21 without autism) matched at the group level on age and biological sex completed a simultaneity judgement electroencephalography (EEG) task. During this task, participants were shown synchronous and asynchronous videos of a female speaker saying “ba.” Asynchronous videos were presented at four stimulus onset asynchronies (SOAs; i.e., the length in time between the onset of the visual and auditory components of the speech signal). Participants were instructed to fixate on the mouth and to use their right hand to indicate whether the audio and visual stimuli occurred synchronously or asynchronously via a keyboard button press after each trial. Participants were told to respond only when a response screen appeared to decrease movement artifacts in the window of interest (i.e., 800ms post stimulus onset). Participants completed 5-7 blocks of the task, each of which contained 105 stimuli presented in a random order, for a total of 525 to 735 trials. Data were cleaned, rereferenced to average, and baseline corrected prior to analyses; additionally, asynchronous trials were time-centered such that 0ms represented the onset of the auditory stimulus across all trial types. Based on previous research utilizing a similar task in adults, the P3 wave was defined as by averaging the voltage across six electrodes positioned over the parietal scalp (E54, E55, E61, E62, E78, and E79) in the time window between 400-650ms. A mixed model ANOVA with group as a between-subjects factor and SOA as a within subjects factor was utilized to determine the extent to which groups differed in their neural process of asynchronous audiovisual speech.

**Results**: Data cleaning is ongoing. Preliminary results were run on data from 18 participants (11 with autism, 7 without autism). Results of the ANOVA indicated that there was no main effect of group, $F$ (1, 16) = 0.50, $p$ = 0.492, or SOA, $F$ (2.08, 31.20) = 2.07, $p$ = 0.142. There was however a significant interaction between group and SOA, $F$ (2.080, 31.20) = 6.91, $p$ = 0.003. During synchronous videos, groups significantly differed in their P3B responses ($p$ = 0.023); youth with autism presented with significantly smaller P3b amplitudes. This difference was not evident at other SOAs.

**Discussion:** Preliminary results indicate that P3B responses during an audiovisual simultaneity judgment task do differ in youth with and without autism during synchronous trials. Clinical and research implications, limitations, and future directions for this line of research in light of final analyses will be discussed at the Gatlinburg Conference.

**References:**


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