EEG-TBI Project – Auditory Stimulus Details

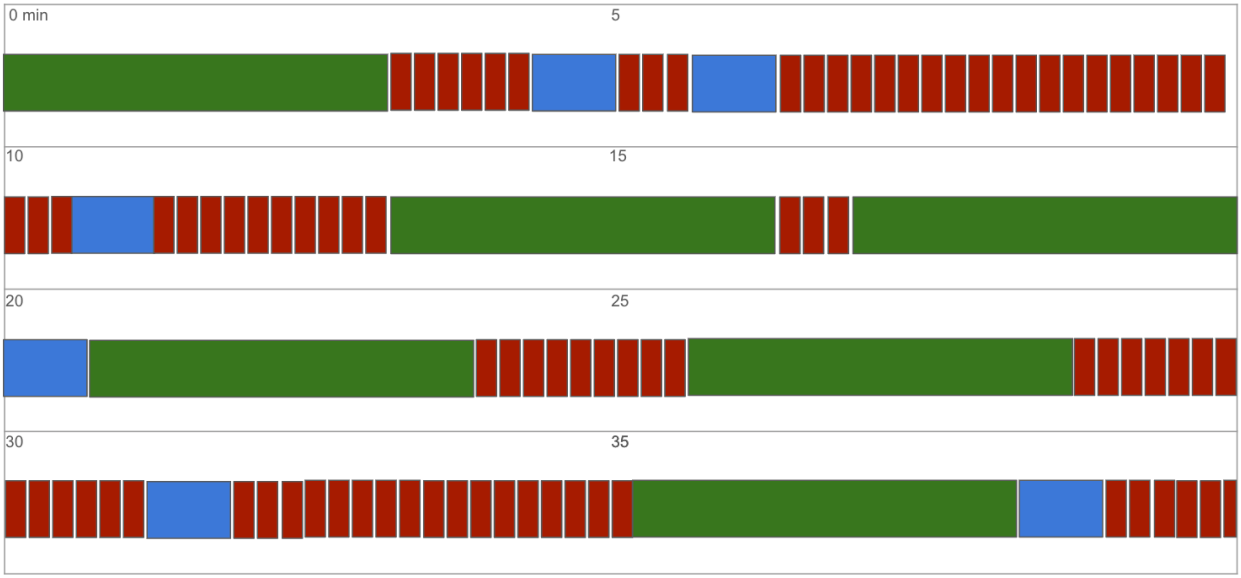
Stimulus Overview:

The auditory stimulus needs to be a combination of three different trial subtypes, each of which will be part of a separate analysis: reactivity stimulus, language tracking stimulus, and cognitive-motor dissociation stimulus. Each subtype will have multiple trials. The trials should be played in a random order to mitigate any effect there might be of the stimulus being played early or late in the protocol. The total stimulus duration will be ~40-45 minutes.

Stimulus Output File:

Since trials will be randomly presented, there needs to be a record of which stimulus was presented when (for analysis of EEG later) – this should be part of the output file that the stimulus software outputs after it presents the full stimulus.

General Stimulus structure (example – trial order will be random for each patient):



Blue = reactivity stimulus (~45 sec each)
Red = language tracking stimulus (~17 seconds each)
Green = cognitive-motor dissociation stimulus (~200 seconds each)

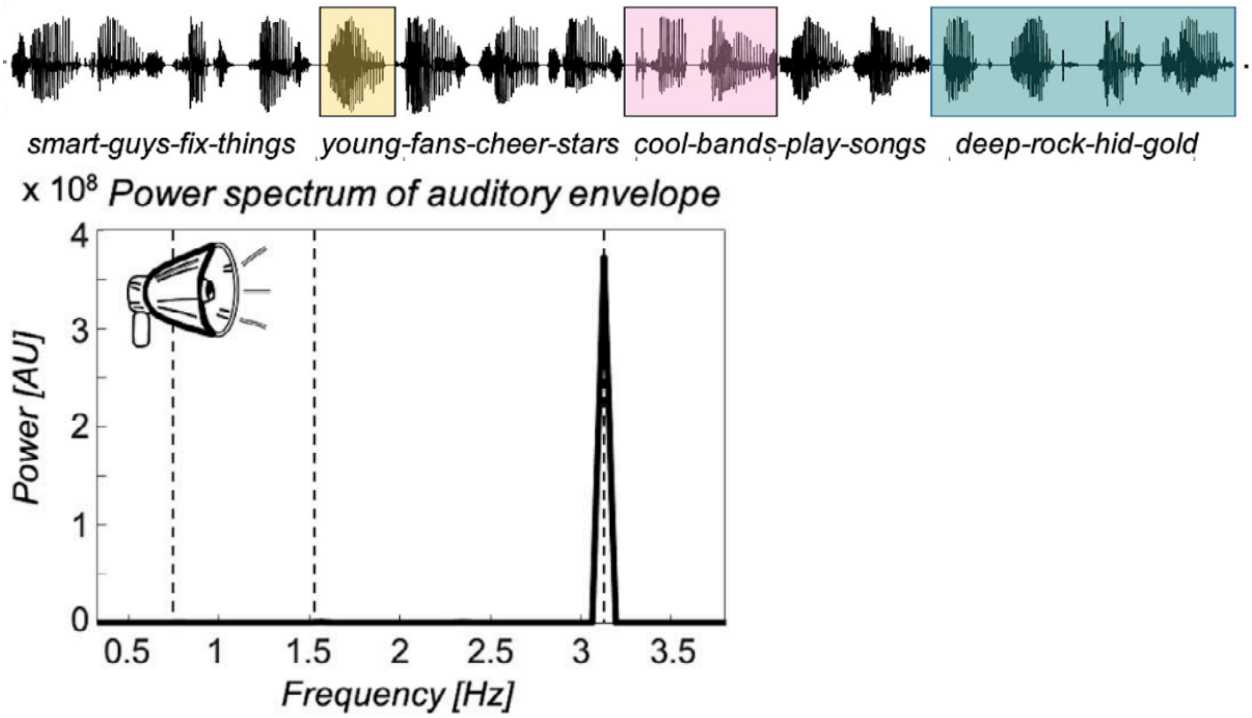
Specifics of each trial type:

reactivity stimulus

- Each trial consists of a 15 second (70 decimals) beep followed by 30 seconds of silence
- There should be a total of 6 trials

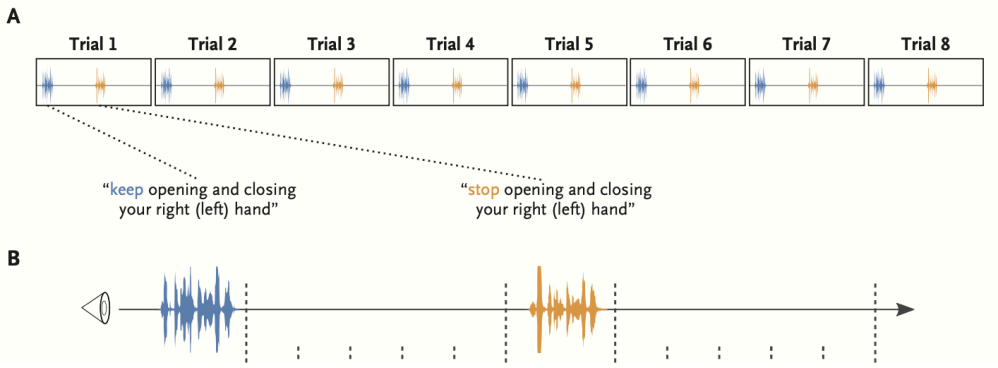
language tracking stimulus

- Each trial consists of series of isochronous mono-syllabic words presented at a rate of 3.125 Hz. The words will come directly from the sentences that Rodika provided (there are 72 total 4-word sentence), and need to be precisely 320 ms in length with no gaps in between (this will produce the 3.125 Hz frequency).
- a trial consisted of 12 of these 4-word sentences (48 words), selected randomly (no repeats within the same trial), with a ~2 second pause after all 12 sentences run; trial duration should be approximately 17 seconds
- there should be a total of 72 trials, and every sentence should be used approximately the same number of times
- there should be no acoustic information in the sentences (e.g., you should not be able to tell that a sentence is ending because of something in the way the voice changes) - just in case the Google Voice software does anything like this by default, will need to be removed.



cognitive-motor dissociation stimulus

- each trial consists of eight sentence pairs, where each sentence within the pair is followed by 10 seconds of silence (total of ~25 seconds x 8 pairs = ~200 seconds)
- each sentence pair should be “keep opening and closing your (right/left) hand” followed by “stop opening and closing your (right/left) hand”
- There should be a total of six trials, three (3) where the hand laterality is RIGHT and three where the hand laterality is LEFT


A
Trial 1
Trial 2
Trial 3
Trial 4
Trial 5
Trial 6
Trial 7
Trial 8
"keep opening and closing your right (left) hand"
"stop opening and closing your right (left) hand"
B