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## Effect of tDCS Stimulation on Conner's CPT Performance of Young Adult

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# Effect of tDCS Stimulation on Conner's CPT Performance of Young Adult

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## 1. Introduction

- Used a mock experimental data but the hypothesis behind it can further be explored
- tDCS is applied through the skull to modulate the excitability of cortex.
- EEG records-
  - ✓ the rhythmic cortical activity
  - ✓ the changes in activity for different cognitive tasks
  - ✓ brain activity with concussion history and ADHD



Figure: Standard sizes shown (5x7cm, 5x10 cm, 10x10 cm); Not shown (3x5)



Figure: tDCS on Olympic 2020

## 3. Rationale

- to see whether mild anodal stimulation of the visual cortex of a healthy adult volunteer will result in more efficient visual stimulus processing
- to improve their attention and performance.
- May have implications for ADHD treatment

## 4. Methods

**Participants:** 1 undergraduate college student

**Materials:**

- Conners CPT
- Transcranial Direct Current Stimulation,
- B-Alert Software

**Procedure:**

- Baseline Test
- Sham Stimulation
- tDCS Stimulation

**Research Design:** Within Subject Factor Design

**Statistical Procedure:** Doubly multivariate analyses of variance (MANOVA), Paired Sample t-test

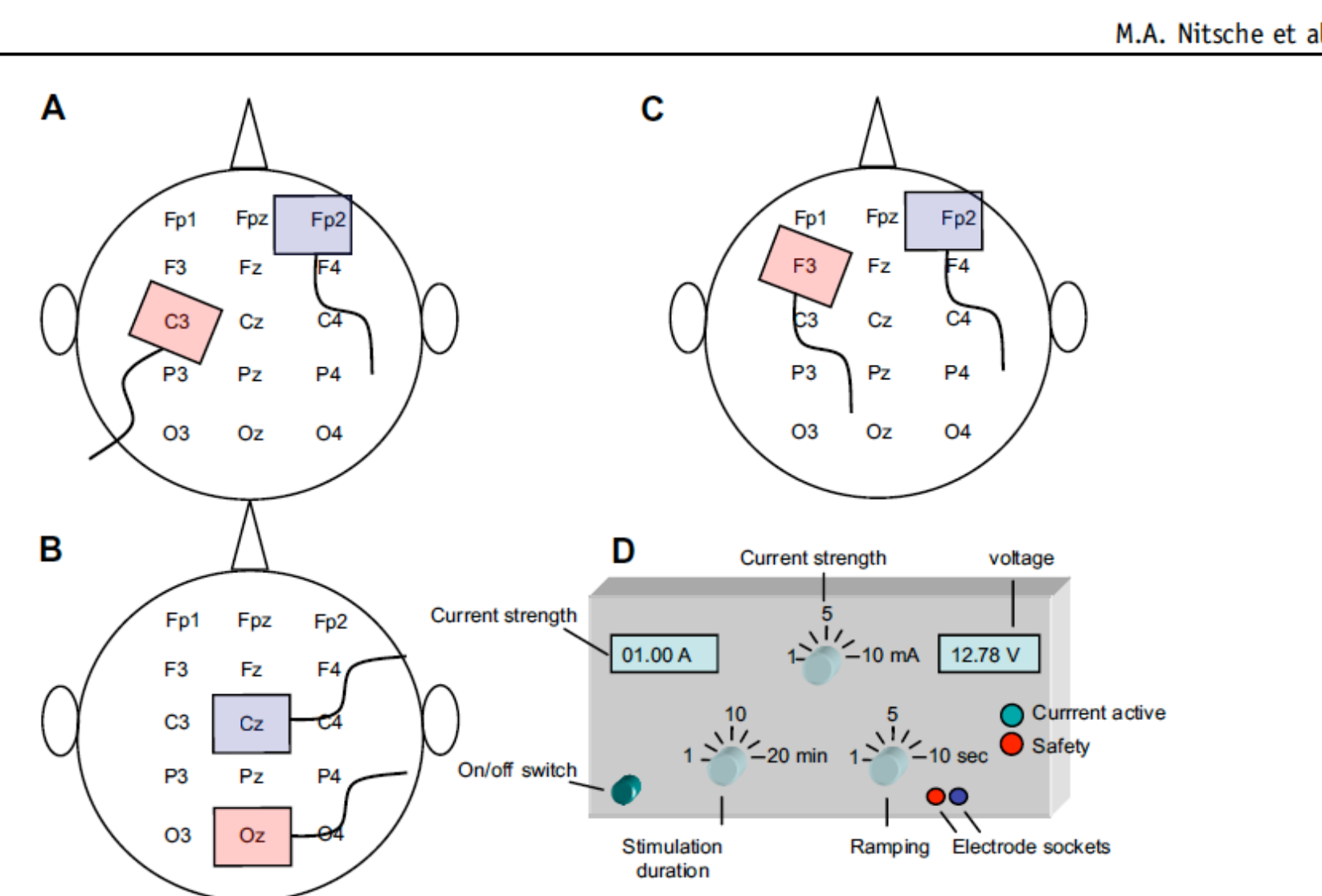


Figure: tDCS Montage

## 2. Objectives

1. To see the difference between sham and tDCS stimulation in Conners CPT for high engagement and cognitive workload.
2. To see an increase in the excitability of the visual cortex and decrease in the interference from lower frequency waves
3. To see the performance in Conner's CPT for sham and tDCS stimulation

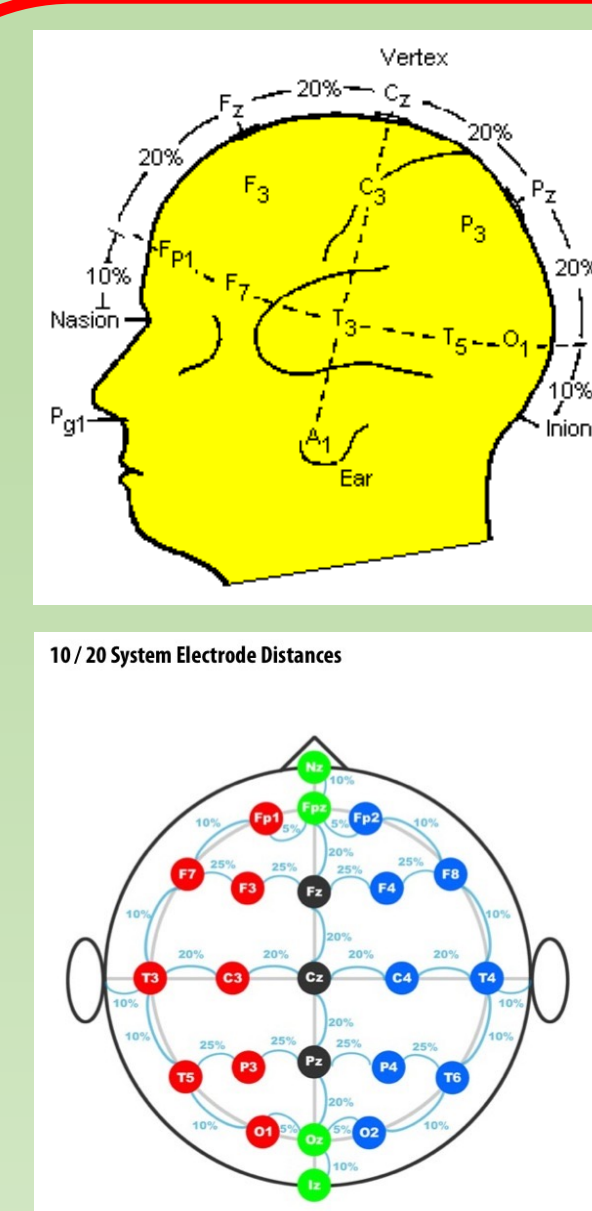


Figure: B-Alert Wireless EEG Setup

## 5. Results

**EEG for PSD band at POz, overall, and classification statistics:**

- brain stimulation by tDCS excited the particular brain area
- POz and overall beta activity increased for tDCS session than sham
- High workload increased beta and theta activity in the frontal regions

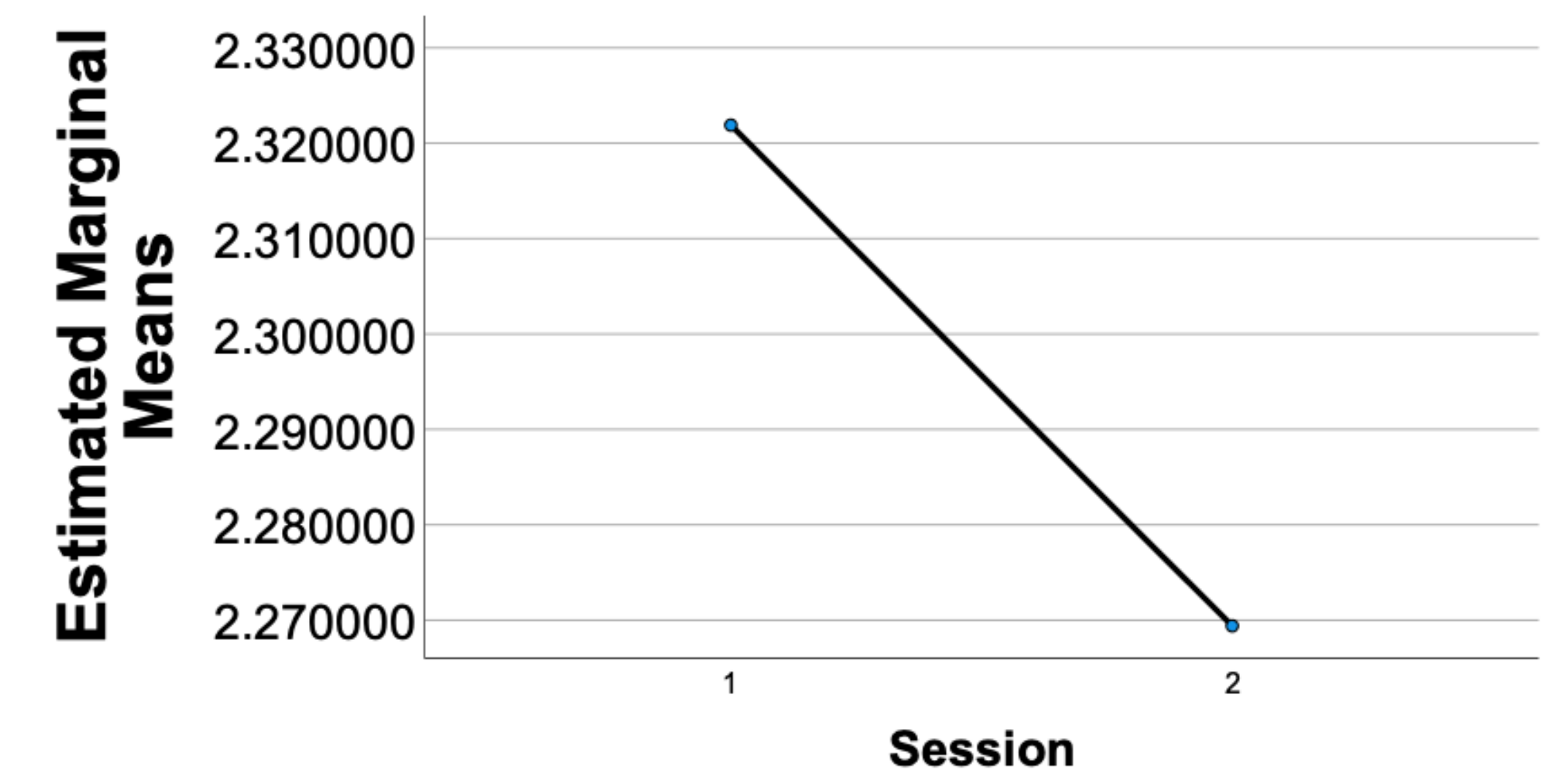
**Conners CPT data analysis with errors of omissions and commissions:**

- significant for both omission and commission across session
- improvement in detectability and high vigilance in terms of tDCS stimulation

**Analysis on latency data for correct responses:**

- no changes in any of the variables based on stimulation type

### Estimated Marginal Means of POz\_Theta



## 6. Limitations and Recommendation

- Overall theta did not support the hypotheses
- Significance value for high engagement was (0.056)
- There was only one participant, but the hypothesis is worth pursuing further with a large sample:
  - to get significant value
  - to support all the hypotheses