The Impact of Concussion on the N200 ERP Elicited During a Cognitive Inhibition Task: Preliminary Results

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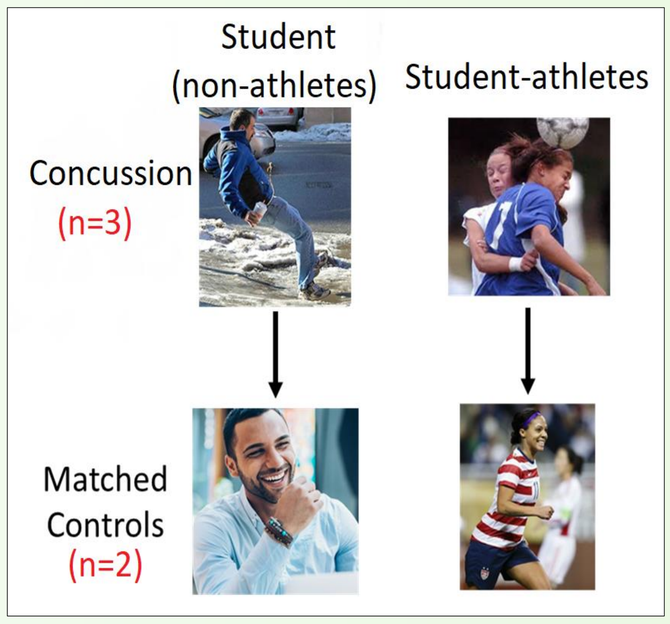
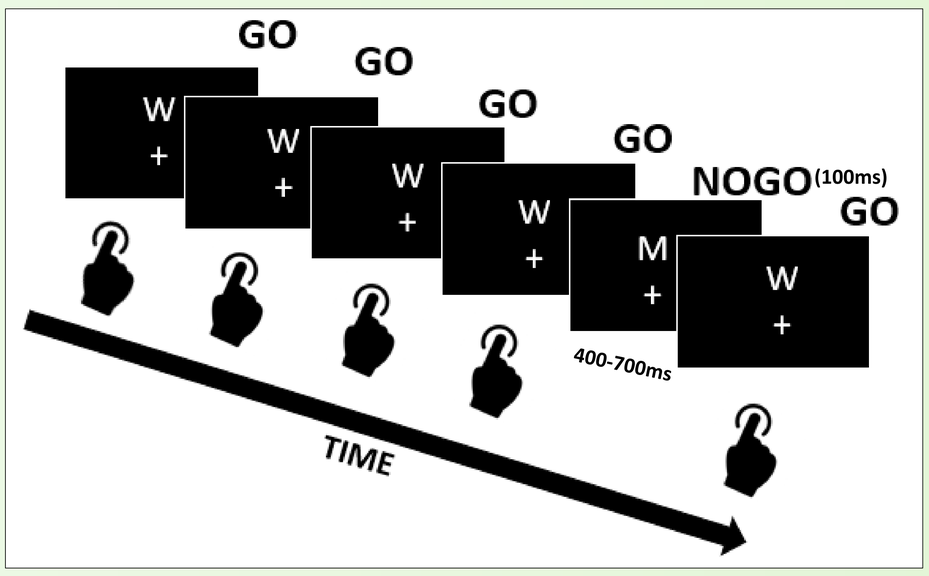
Introduction

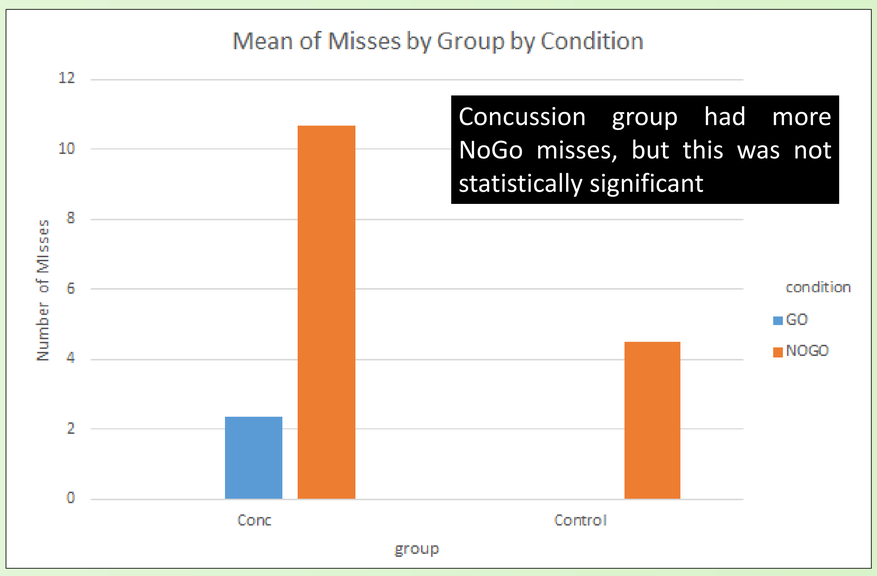
Every year 1.6 to 3.8 million concussions occur from sports participation alone[1], which has driven the increased focus on determining what, if any, long-term impairments are the result of sustaining a concussion. The N200 event-related potential (ERP) is a neural marker of inhibition and has been found to be altered in populations that have previously experienced a concussion. There are discrepant findings concerning the effects of concussion during the post-acute phase on the N200 ERP elicited during working memory[2], cognitive control[3], cognitive inhibition[3,4], and attentional mental processes[5]. However, the extent to which concussions influence cognitive inhibition processes, reflected in the N200, has yet to be investigated in the acute recovery phase of concussion. **Therefore, the goal of the current study was to investigate whether acute concussions influence the N200 ERP component elicited during response inhibition compared to matched controls.**

Participants

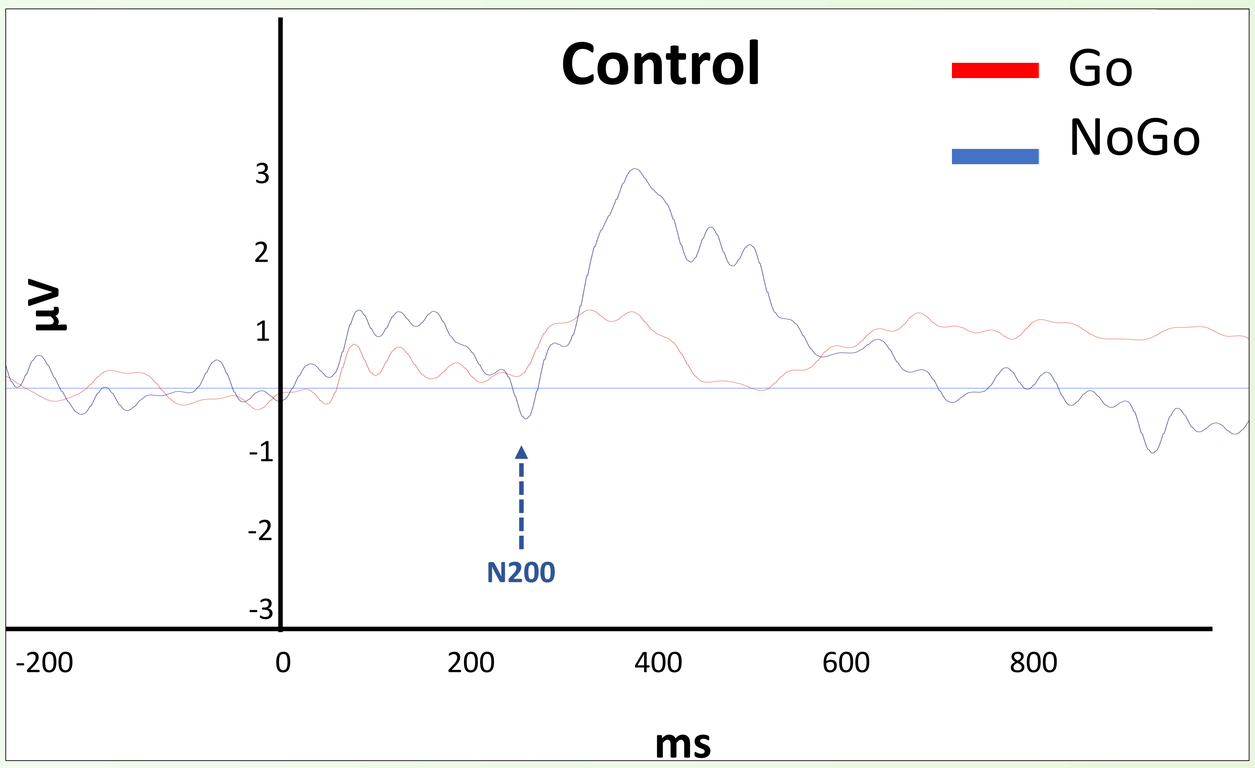


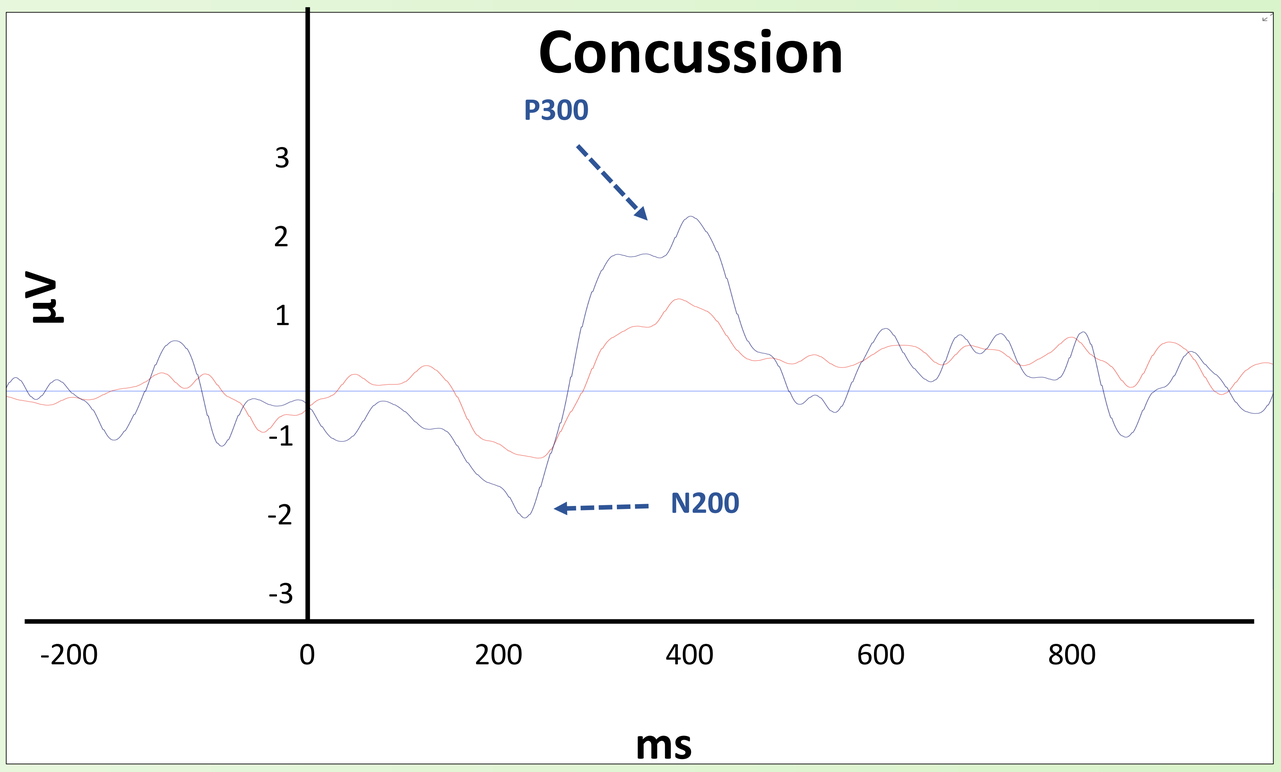
Go/No-Go Task





Preliminary Results





Significant *Condition*Group* interaction on N200 amplitudes, $F(1, 3) = 129.09$, $p = .001$. To NoGo trials, concussed participants displayed more negative N200 amplitudes ($M = -1.62$, $SD = 0.67$) than the control group ($M = 1.74$, $SD = 0.77$), ($F(1,3) = 11.48$, $p = .043$).

Conclusion & Future Directions

These preliminary findings suggest that concussions alter the neural underpinnings of response inhibition immediately after injury. However, the preliminary nature of the findings precludes us from forming any strong conclusions which awaits a larger sample size. Our ongoing research is examining the impact of sports-related concussions and non-sports-related concussions on N200 amplitude and latency over three different time points (post-concussion, return to learn or play, and one-month after return to learn/play). Ongoing analyses also include examining the extent to which the P300 (positive potential proceeding the N200) changes over concussion recovery.

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