INTRODUCTION

The Contingent Negative Variation (CNV) consists of slow negative potentials that depend on the association or contingency of preparatory and imperative stimuli during a warning reaction task requiring a response (Tece, 1972). The CNV is classified into early and late components. The early CNV (eCNV) relates to orientation to the preparatory stimulus and expectation associated with the imperative stimulus. The late CNV (ICNV) relates to the anticipation of processing the imperative stimulus and preparation for a motor response. The amplitudes of the eCNV and ICNV are positively related to the degree of orientation, expectation, and preparation for the paired preparatory and imperative stimuli (Brunia & Bostel, 2001). The more neural resources allocated for cognitive and motor processing required for a task, the greater the negativity of the CNV. The ICNV amplitude is maximal at the central sites (Brunia & Bostel, 2001; MacKinnon, Allen, Shinarot, & Rogers, 2013) and is attenuated at the Fz site (Lassen, Sambeth, Riedel, & Vuurman, 2013). Neurofeedback (NFB) is a procedure used to affect brain processing required for a task, the greater the negativity of the CNV. The ICNV amplitude is maximal at the central sites (Brunia & Bostel, 2001; MacKinnon, Allen, Shinarot, & Rogers, 2013) and is attenuated at the Fz site (Lassen, Sambeth, Riedel, & Vuurman, 2013). Neurofeedback (NFB) is a procedure used to affect brain processing required for a task, the greater the negativity of the CNV. The ICNV amplitude is maximal at the central sites (Brunia & Bostel, 2001; MacKinnon, Allen, Shinarot, & Rogers, 2013) and is attenuated at the Fz site (Lassen, Sambeth, Riedel, & Vuurman, 2013).

HYPOTHESES

1. The eCNV amplitude is expected to follow a central maximal distribution across conditions.
2. The eCNV amplitude is expected to have a greater negativity at the central site for the experimental condition than the control condition.
3. The ICNV amplitude is expected to follow a central maximal distribution across conditions.
4. The ICNV amplitude is expected to have a greater negativity at the central site for the experimental condition than the control condition.

METHODS

Participants
- EEG Data
- 10 CSU Northridge college students
- Design
- The study was a between-subjects design with an experimental (NFB) and control (No-NFB) condition.

Experimental Condition (NFB)
- Participants performed an attention task immediately following a neurofeedback session.
- Neurofeedback procedure involved a 30-minute EEG recording with visual, tactile, and auditory feedback.

Control Condition (No-NFB)
- Participants without any previous experience of neurofeedback procedure performed an attention task.

RESULTS

Early CNV Amplitude and Topography
- Interaction Effect (Condition x Lead): Significant interaction effect, F(2, 16) = 3.72, p < .05.
- The difference between No-NFB and NFB differs across Fz, Cz, and Pz.
- Post-hoc Comparisons between Conditions across Leads:
  - No-NFB vs. NFB at Fz, p > .05
  - No-NFB vs. NFB at Cz, p > .05
  - No-NFB vs. NFB at Pz, p > .05
- The difference between No-NFB and NFB is significant at the central site.

Late CNV Amplitude and Topography
- Interaction Effect (Condition x Lead): Significant interaction effect, F(2, 16) = 3.72, p < .05.
- The difference between No-NFB and NFB differs across Fz, Cz, and Pz.
- Post-hoc Comparisons between Conditions across Leads:
  - No-NFB vs. NFB at Fz, p > .05
  - No-NFB vs. NFB at Cz, p > .05
  - No-NFB vs. NFB at Pz, p > .05
- The difference between No-NFB and NFB is significant at the central site.

REFERENCES


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