

**Electroencephalographic Asymmetry, Emotion Regulation,  
and their Relationships with Depression Risk**

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Dissertation Abstract

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## Abstract

**Background:** Research investigating patterns of electroencephalographic (EEG) brain asymmetry aids our understanding of neural systems involved in the processing of emotion, motivation, and psychopathology. Withdrawal-motivated negative emotions characteristic of depression are associated with relative right prefrontal cortex (PFC) activity, whereas approach-motivated positive emotions are associated with relative left PFC activity. Styles of emotion regulation (ER), or modulation of the intensity and duration of emotional responses, are also associated with presence (e.g., suppression, or maladaptive ER) versus absence (e.g., cognitive reappraisal, or adaptive ER) of depression vulnerability. Most PFC asymmetry studies of emotion, depression, and/or ER rely upon EEG recorded during uncontrolled resting states that appear to be less reliable than EEG recorded during cognitive or emotional challenge tasks. To this end, the present study examines whether current/future depression symptoms and ER styles moderate PFC asymmetry when individuals attempt to recover from an emotional challenge.

**Methods:** EEG asymmetry was recorded before, during and after 38 young adults experienced a state emotion manipulation induced via film clip (happy:  $n=16$ ; sad:  $n=22$ ). Self-reported depression symptoms and ER were collected in the same session as EEG asymmetry as well as a follow-up session one year later.

**Hypotheses:** It was predicted that participants in the sad film clip condition would demonstrate greater relative right PFC asymmetry than participants in the happy film clip condition, consistent with prior state emotion manipulations. With regard to within-subjects changes over time, it was predicted that trait sadness (depression) and use of ER strategies would be associated with PFC asymmetry during and after the film clip mood induction. For the longitudinal

component, it was hypothesized that relative right PFC asymmetry and use of ER strategies would be associated with future depressive symptoms, one year after EEG recording.

**Results:** Although happy and sad groups did not differ in PFC asymmetry pre-, during- or post-clip, moderation analyses revealed that individuals with lower depression symptoms or greater use of adaptive ER strategies paired with greater leftward PFC asymmetry during the film clip resulted in greatest relative left PFC asymmetry post-clip. However, PFC asymmetry and ER styles were not associated with the onset of depressive symptoms at follow-up.

**Conclusions:** Approach-related brain activity paired with adaptive ER and lower depressive symptoms promote approach-related recovery from brief emotional states and could index a marker for resilience to stress.