Hypotheses

**Hypothesis 1:** Participants run on fall mornings will show more relative right frontal activity versus those assessed on spring mornings. In a sample of 163 non-depressed individuals, a time-of-year by time-of-day interaction was just shy of significance. Although the direction differs from that of Peterson & Harmon-Jones, with participants assessed on fall mornings having more relative right frontal activity than those assessed on spring mornings. To determine if the effects were due to seasonal variations such as photoperiod or possibly driven by seasonal psychosocial stressors inherent in a student sample, season was replaced by a dimensional scale of length of photoperiod; significant findings were largely consistent with those based on fall/spring coding. Morning sessions run in periods of less light show more relative right frontal activity than other session times. Time awake appears to be an important moderating variable for the interaction of photoperiod and session time. Results of this study highlight the need to monitor or control seemingly extraneous factors that influence frontal EEG asymmetry to be trait indices of motivational/affective propensities.

**Hypothesis 2:** In a sample designed to replicate the time of year by time of day interaction of Peterson and Harmon-Jones (2008), the relationship was found to be in the opposite direction, with fall morning sessions characterized by the greatest relative left frontal activity. Peterson and Harmon-Jones concatenated evening and afternoon sessions into a single condition, which may help explain why results for the present study vary from those previously reported as the magnitude of the difference between evening sessions and morning sessions in the fall is not considerable.

**Hypothesis 3:** When time awake is factored into the model, people run in periods of less light who awake before 4-6 hours before their sessions. Peterson and Harmon-Jones (2008), of the present study and that of Peterson and Harmon-Jones. In periods of less light, those who wake up before 4-6 hours before their session time in the morning showed more relative right frontal activity than those who had been awake for a longer period of time. For the present sample most sessions started after 10am, a relatively late start time, possibly allowing participants more time to wake up before their sessions.

**Hypotheses**

- Frontal EEG asymmetry has been investigated as a marker of risk for depression and emotion-related psychopathology in many studies over the past several decades. Although largely supportive of the proposition that frontal EEG asymmetry may index a risk factor for depression, results have been somewhat inconsistent. This may partially due to the influence of state variance inherent in every sample such as time of day and time of year.
- In general, on a trait level, relatively less left than right resting frontal activity is thought to reflect a propensity towards lower approach and greater withdrawal motivation (e.g. Coan & Allen, 2000) and may function as a trait marker of depression (e.g. Allen, Urry, Hitt, & Coan, 2004).
- The change in the number of hours of daylight is thought to relate to the winter lowering of mood. One study to date suggests that there may be seasonal effects on frontal EEG asymmetry (Peterson & Harmon-Jones, 2008).
- Sources of state variance may be problematic for researchers looking for stable trait markers of depression, but they may also reveal interesting Psychophysiological information about normal variation in mood.

**Hypothesis 1:** Participants run on fall mornings will show more relative right frontal activity versus those assessed on spring mornings. With participants run in the spring and other session times.

**Hypothesis 2:** A dimensional scale reflecting hours of light in a day (photo period) might be a better metric to capture the underlying construct than the categorical variable of season.

**Hypothesis 3:** Time awake before recording will interact with session time and photo period, while those who only recently awake expected to show more right frontal activity.

**Statistical Analysis:**

- Full factorial mixed linear model (SAS 9.2) was run with Falcon Equinox: [R]-In[L] Total Alpha Power

**References**


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