Social Science/Psychology Sample Thesis Proposal

Honors Thesis Proposal: Mindfulness and Emotion-Modulated EMG Startle Response

Background:
The facial electromyogram (EMG) startle reflex refers to activation of the orbicularis oculi muscle following the sudden presentation of intense stimuli. As magnitude of the startle reflex varies with changes in affective state and the psychopathology of the group being studied, this measure is often used in studies investigating differences in emotional and motivational regulation (Lang, Bradley, & Cuthbert, 1990; Grillon & Baas, 2003). Mindfulness—paying deliberate, nonjudgmental attention to the present—practice and interventions are associated with improved scores across a wide variety of measures (e.g., pain intensity, depression, anxiety, stress, worry, blood pressure, heart rate, distress tolerance, &c), but has been studied most frequently as a treatment for/protective factor against anxiety disorders (Kingston, Chadwick, Meron, & Skinner, 2007; Delgado, Guerra, Perakakis, Vera, Paso, Vila, 2010; Sharpe, Perry, Rogers, Dear, Nicholas, Refshauge, 2010). People with anxiety disorders, compared to typical samples, show an elevated startle response across several different emotional valence categories (Grillon, 2002). Given the relationships between elevated EMG startle response, mindfulness, and anxiety, one could hypothesize that people with higher mindfulness levels and/or those who undergo mindfulness interventions will show blunted startle responses across multiple valence categories.

Method:
In this study, college students’ EMG startle responses were collected during an emotion-modulated startle paradigm via two 4-mm, Ag/AgCl electrodes placed over the orbicularis oculi muscle. Self-reported mindfulness was evaluated via the Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003). Participants were sorted into either a brief, 3-minute mindfulness intervention group or a control group before undergoing the startle paradigm.

Controlling for anxiety and depression, ANOVA analyses will be conducted in order to determine the relationships between our independent variables (affective valence category, high mindfulness group vs. low mindfulness group, and mindfulness intervention group vs. control group) and dependent variable (EMG startle reflex amplitude).

1. Question 1: Do higher levels of mindfulness (self-reported) predict a more blunted startle response?
   a. DV - startle blink amplitude
   b. IV1 - unpleasant, neutral, pleasant valence
   c. QIV2 - high and low mindfulness groups (from median splits)
   d. Controlling for depression and anxiety
   e. 3x2 mixed factorial design, repeated measures 2-way ANOVA

2. Question 2: Does the mindfulness intervention predict a more blunted startle response?
   a. DV - startle blink amplitude
   b. IV1 - unpleasant, neutral, pleasant valence
   c. IV2 - intervention vs. no intervention
   d. Controlling for depression and anxiety
   e. 3x2 mixed factorial design, repeated measures 2-way ANOVA
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How Proposed Thesis Complements Degree Program
Completion of this Honors thesis will partially fulfill the requirements for the Research Honors distinction, with which I hope to graduate this winter. Additionally, these Honors thesis courses will allow me to draw on the research with which I have been involved for the past 3 years to produce a scholarly work that critically analyzes the EMG data I not only helped collect and process, but also helped figure out how to collect and process. This will be a capstone project for me.
Proposed Method of Assessment

Part 1: Meetings (with Dr. Erin Tully) about Literature Review/Paper Planning

1. June 19
   Assignment: Updated bibliography and oral report on literature search of the following topics:
   a) startle paradigm (i.e., emotion modulated startle) and its link to anxiety
   b) mindfulness (and mindfulness interventions) and its link to anxiety
   c) mindfulness and the startle paradigm

2. July 3
   Assignment: Outline for introduction section, integrating bibliography

3. July 17
   Assignment: Outline for method section

4. July 31
   Assignment: Revisions to introduction and method outlines, written hypotheses, outline of statistical plan to test hypotheses

Part 2: Biweekly meetings with grad. student (Alyssa) to review progress on EMG data processing tasks

1. Dates TBA
   Assignment: AcqKnowledge data files assigned for various types (TBD) of data processing and, eventually, analysis.
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