BHCOE Pilot Award 2021-2022
Decoding Internal Emotional Responses
PI: Steven J. Luck, Ph.D.

Emotions play a fundamental role in mental illness. However, emotions are internal experiences, which can make it difficult to assess disorders of emotion and to determine the effectiveness of new treatments. The goal of our project is to use state-of-the-art neural decoding methods to provide an objective measure of emotional responses.

Our first experiment, which is now complete, was designed to demonstrate that we can in fact decode emotional responses from scalp EEG recordings. The participants viewed photographs of natural scenes that were emotionally positive (e.g., smiling children), emotionally negative (e.g., an accident victim), or emotionally neutral (e.g., an empty room). Using machine learning algorithms, we were able to decode whether the scene being viewed was positive, negative, or neutral.

We are now halfway through with a follow-up experiment that asks whether the decoded emotional responses of a given individual are related to that person's level of anxiety-related and depression-related symptoms. Our final experiment, which will begin in early 2022, will ask whether we can change the neural response to a scene by "reframing" the meaning of the scene (e.g., having the participant interpret an image of a crying person as someone whose child has successfully recovered from a surgery).