

The Hilda and Preston Davis Foundation Awards Program for
Eating Disorders Research: Junior Faculty
2019 Award Recipients

- Ann Haynos, Ph.D.
Assistant Professor
University of Minnesota

Realtime fMRI Neurofeedback to Alter Limbic Disturbances and Eating Disorder Behavior in Anorexia Nervosa

Treatment progress for anorexia nervosa (AN) has been slowed by inadequate translation of basic findings on the neurobiological mechanisms promoting AN into interventions. Therefore, there is an urgent need to develop novel approaches to altering the key neural processes implicated in the persistence of disordered eating in AN. AN is characterized by pronounced problems with emotion regulation that maintain eating disorder behaviors (e.g., restrictive eating) and do not resolve with standard treatment. Emerging evidence highlights disrupted functioning of brain regions involved in the limbic circuit (e.g., amygdala) in AN, which promotes emotion regulation deficits and, thereby, eating disorder symptoms. Individuals with AN demonstrate poor coordination between the amygdala and prefrontal cortex (a cognitive control region) and hyperactivity of the amygdala to aversive stimuli. However, there are no treatments for AN aiming to directly correct limbic disturbances. Realtime fMRI (rtfMRI) neurofeedback is an innovative, noninvasive method for altering neural circuit disruptions that provides individuals visual data showing their moment-to-moment brain activity and allows them to use this information to alter neural activation in real time. rtfMRI neurofeedback targeting limbic disturbances has been shown to have a positive clinical impact in psychiatric populations; however, this approach has not been examined in AN. In this study, participants with AN (n=32) will be randomly assigned to receive three sessions of rtfMRI neurofeedback targeting downregulation of the amygdala or the intraparietal sulcus, a sham brain region unrelated to emotional processing, while viewing aversive images. Effects of amygdala (versus sham) neurofeedback on limbic activation, emotion regulation, and eating disorder symptoms will be evaluated to establish the role of limbic circuitry in maintaining symptoms of AN, and the ability of rtfMRI neurofeedback to alter this key neural mechanism. This study will determine

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- Joseph McGuire, Ph.D.