7. Project Summary.

Irritability is a relative predisposition for angry responses to frustration that exists, at some level, in every member of the population, but at the severe end is a symptom transversing the internalizing and externalizing spectra and forecasting future mental illness. There has been increased interest in elucidating the specific deficits that 1) discriminate early irritability that is and is not prodromal to mental illness, and 2) could be reduced through novel intervention. Irritability is modulated by emotion regulation, which can be parsed into non-mutually exclusive automatic (immediate, reactive) and deliberate (longer-unfolding, effortful) response types. Deliberate emotion regulation, more so than automatic, requires greater prefrontal cortex activation and engagement of executive function for successful implementation, and thus may be a better auger of irritability severity and course and a more viable clinical target. However, deliberate emotion regulation is difficult to measure in early childhood and has been under-researched.

The proposed Mentored Patient-Oriented Research Career Development Award will train the candidate to probe deliberate regulation in preschoolers ranging from low to severe irritability, over a period of rapid development, and connect findings to translational implications. The candidate's current expertise includes differentiating the normal:abnormal spectrum of emergent psychopathology, with a focus on early disruptive behavior, multivariate statistics, and basic skills in acquiring and analyzing EEG and functional Near Infrared Spectroscopy (fNIRS) data. To launch a translational program of research that connects a detailed understanding of emotion regulation to emerging psychopathology and more effective treatments, the candidate seeks advanced training in 1) a multi-level approach linking emerging emotion regulation with irritability, 2) developing more refined treatment implications, and 3) longitudinal research. The candidate's mentorship team, Drs. Harvey, Perlman, Wakschlag, Huppert, Grovetant, Deater-Deckard, and Fox, provide expertise in child neuroimaging, emotion regulation, irritability, longitudinal design, and child treatment efficacy.

The proposed study will examine early deliberate emotion regulation, its association with level of concurrent irritability, and changes in irritability, internalizing, and externalizing symptoms one year later. Children ages 3 and 5 years (n = 50) ranging from low to severe irritability will complete a validated automatic emotion regulation task followed by a novel deliberate emotion regulation task. An innovative multi-level approach will be used to isolate deliberate from automatic emotion regulation by simultaneously recording dorsolateral prefrontal cortex activation via fNIRS and facial expression via video. Children will complete the paradigm again one year later and parents will rate their child's irritability, internalizing, and externalizing symptoms at baseline and follow-up. The proposed study is designed to shift the field to focusing on deliberate emotion regulation, inform future longitudinal work, and spur novel interventions for early irritability.