State Space Grids to Study Change in Youth Receiving Treatment for Anxiety Disorders

Matthew M. Carper, PhD[1,3], Jennifer Silk, PhD[2], Cecile Ladouceur, PhD[2], Erika Forbes, PhD[2], Dana McMakin, PhD[2], Neal Ryan, PhD[2], & Philip C. Kendall, PhD[3]

1. Quantitative Sciences Program, Alpert Medical School of Brown University
2. University of Pittsburgh
3. Child and Adolescent Anxiety Disorders Clinic, Temple University

Cognitive behavioral therapy (CBT) is an efficacious treatment for youth anxiety, but we do not yet know how CBT achieves its beneficial effects. Affective variability has recently been explored as a potentially important construct to consider in understanding anxiety disorders. However, past studies have shown mixed evidence regarding the importance of emotional valence when considering affective variability, with some studies showing low psychological well-being is linked to higher variability in positive affect while others link it to higher variability in negative affect. Thus, there is a need to disentangle the effects of affective valence from the effects of affective variability on psychological symptoms and treatment outcomes. The present study used state space grids (SSGs) and a dynamical systems approach to model ecological momentary assessment (EMA) data, and to examine patterns of affective network variability over time and across two treatments. The methods used in the present study quantify affective network variability without concern for emotional valence, which is unique to this body of literature. Participants were 117 youth aged 9-15 years who were enrolled in a larger RCT designed to examine correlates of treatment response among youth with anxiety disorders. Positive and negative affective network activation ratings were plotted on the axes of the SSGs, and separate SSGs were created for each participant. Dispersion values, which quantify the level of variability in the data, were extracted from SSGs. Latent grown curve (LGC) models were constructed to examine changes in affective network variability (dispersion values) over the course of treatment using multigroup procedures in MPlus. Associations between treatment outcome and patterns of affective network variability were also examined. Results revealed that linear models were an excellent fit to the data, χ^2 (20) = 17.72, p = 0.61, RMSEA < 0.001, 90% CI RMSEA 0.000-0.10, CFI = 1.00, TLI = 1.03, SRMR = 0.09. There were significant decreases in affective network variability over the course of treatment for participants in the CBT condition (M = -0.014, SE = 0.007), but not for those in the control condition (M = 0.01, SE = 0.01). Changes in affective network variability over the course of treatment did not predict treatment outcomes (all p's > 0.05). Findings provide initial support for the use of SSGs to model changes in affective dynamics that occur during treatment. However, there remains a need to demonstrate the utility of SSGs in predicting treatment outcomes. Implications for future research will be discussed.

Questions regarding this presentation can be directed to matthew_carper@brown.edu