Neurobiological Mechanisms of Cognitive Processing Therapy for Post-Traumatic Stress Disorder: A Brain Network Approach

Abstract
Psychotherapy research is increasingly targeting both psychological and neurobiological mechanisms of therapeutic change. This trend is evident in and applicable to post-traumatic stress disorder (PTSD) treatment research given the high nonresponse rate of individuals with PTSD who undergo cognitive-behavioral therapy (CBT). A review of the literature investigating neurobiological mechanisms of CBT in PTSD reveals inconsistent results that fail to fully support dual process or learning models of CBT effects in the brain. However, network-based models of psychopathology provide a new framework from which to understand both mental disorder symptoms and therapeutic mechanisms. The current study investigated a) whether brain networks commonly implicated in psychopathology (e.g., default mode network [DMN], central executive network [CEN], and salience network [SN]) changed following Cognitive Processing Therapy (CPT) for PTSD and b) whether change in these networks was associated with PTSD and/or transdiagnostic symptom change. Independent components analysis was implemented to investigate resting-state functional connectivity in DMN, CEN, and SN in 42 women with PTSD and 18 trauma-exposed controls (TEC). Results indicated no significant differences in DMN, CEN, or SN functional connectivity in participants with PTSD versus TEC before or after CPT. Further, participants who completed CPT did not evince significant change in these networks pre- or post-CPT. Several methodological reasons for null results and future directions for research are discussed.