

## Volume 4, Number 12, December 2019

A brief summary of the articles appearing in this issue of *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*.

### Emotion Processing in Children With Autism

Social cognition is impaired in autism spectrum disorder (ASD), but the underlying neural mechanisms remain unclear. **Leung et al.** (pages 1021–1030) used magnetoencephalography to examine brain activity during emotional face processing and found that, relative to typically developing children, children with ASD showed reduced task-related brain activity to emotional faces in the thalamus and posterior cingulate cortex, brain regions used to process emotions. Children with ASD also showed increased activity to happy over angry faces, the opposite of control children. These results suggest that children with ASD may not process angry faces in an age-appropriate manner, which may contribute to the social cognition deficits observed in ASD.

Disruptive behaviors such as anger, irritability, and aggression are common in children with ASD, but the neural mechanisms underlying these behaviors remain unknown. **Ibrahim et al.** (pages 1031–1041) examined functional connectivity during a fear processing task in children with ASD with or without co-occurring disruptive behavior. Relative to children with ASD only, children with ASD and co-occurring disruptive behavior showed reduced connectivity between the amygdala and ventrolateral prefrontal cortex, a circuit implicated in emotion regulation. This study provides evidence that the neural mechanisms of emotion processing may be distinct in children with ASD and disruptive behaviors.

### Oxytocin: Empathic Accuracy and Gender

Oxytocin has been shown to selectively improve empathic accuracy, a social cognitive ability, in men with less social proficiency (i.e., men who scored higher on the Autism Spectrum Quotient). **Bartz et al.** (pages 1042–1048) extend that work in this randomized, double-blind, placebo-controlled, crossover trial. The authors replicate that finding in men, but in contrast find no effect of oxytocin on empathic accuracy in women. These findings support the functional role of oxytocin in human sociality and highlight the need for future work to consider oxytocin's sexually dimorphic effects when evaluating its therapeutic potential in psychiatric disorders marked by impaired social functioning.

### Glutamate and Glutamine in Depression

Research has identified altered neurometabolites in major depressive disorder (MDD), including glutamatergic deficits in the anterior cingulate cortex, a brain region linked to affective processing and symptoms of depression, but most studies have lacked the field strength to measure glutamate and glutamine levels separately, and findings have been mixed. Here, **Colic et al.** (pages 1049–1058) used high-field (7T) magnetic resonance spectroscopy and found a higher

glutamine/glutamate ratio in patients with MDD compared with healthy control subjects. Further, neurometabolite levels differed between MDD groups defined by symptom severity and levels of anhedonia.

### Trauma, Functional Connectivity, and Sleep

Posttraumatic stress disorder (PTSD) is associated with sleep disturbances and abnormalities in large-scale brain networks. Using resting-state functional magnetic resonance imaging in persons recently exposed to a traumatic event, **Seo et al.** (pages 1059–1069) found that poorer sleep quality is associated with greater functional connectivity between fear-related brain areas and regions of the salience network. Greater symptoms of PTSD were associated with less functional connectivity between fear-related seeds and anterior emotion regulation regions. These data provide insight into the biological disruptions that are often observed in trauma-exposed individuals, regardless of whether they have symptoms of or meet the full diagnostic criteria for PTSD.

### Subcortical Structure in Bulimia Nervosa

Volumetric analyses of subcortical structures have yielded mixed findings in bulimia nervosa. Here, **Berner et al.** (pages 1070–1079) used vertexwise analyses to assess the shape of subcortical structures in female adolescents and adults with bulimia nervosa and healthy control participants. Findings in the bulimia nervosa group revealed localized deformations on the surface of subcortical structures in areas that comprise both reward and cognitive control circuits, including the basal ganglia, anterior pallidum, and striatum. These deformations were associated with symptom severity and illness duration. These data advance our knowledge of the subcortical structural alterations associated with bulimia nervosa.

### Modeling Brain Activity and Food Reward

One theory of behavioral addictions proposes a model of three key neural systems that become unbalanced: an impulsive (reward-seeking) system involving the striatum, a reflective (self-control) system involving the prefrontal cortex, and a homeostasis sensing system involving the insular cortex. To investigate the neural dynamics among these systems, **He et al.** (pages 1080–1089) used functional magnetic resonance imaging in healthy young adults during a food-specific task under two conditions. The food deprivation condition was associated with increased difficulty inhibiting responses to high-calorie foods. Further, deprivation increased neural activity of the insula and the striatum in response to high-calorie foods and increased anterior cingulate cortex and dorsolateral prefrontal cortex activity during behavioral inhibition trials. These results support the tripartite model of decision making.