Abstract: Obsessive-compulsive disorder (OCD) is a psychiatric condition that typically manifests in compulsive urges to perform irrational or excessive avoidance behaviors. Researchers have proposed that the need to perform these senseless compulsions might arise from an imbalance between automatic habits and more purposeful, goal-directed control over action. In three separate case-control laboratory studies, we found convergent support for this hypothesis, demonstrating that OCD patients have a bias toward forming habits, likely driven by deficits in goal-directed control over behavior. Using functional magnetic resonance imaging (fMRI) we found an association between habit-forming in OCD and abnormal patterns of hyper-activation in regions associated with goal-directed control over action, the caudate and medial orbitofrontal cortex - regions consistently implicated in the pathophysiology of OCD. More recently, using large-scale online data collection and computational modeling, we found that these deficits in goal-directed control were not unique to OCD, but rather constitute a dimensional marker of ‘compulsivity’ across many psychiatric disorders, including addiction and eating disorders. In two independent samples, with just under 2000 participants in total, we show that compulsivity is associated with normal variation in goal-directed learning and crucially, exhibits excellent
discriminative validity with respect to non-compulsive psychopathology. Finally, ‘compulsivity’ explained deficits in goal-directed control better than any existing DSM diagnostic category included in this investigation. These data go some way towards realizing the potential of a dimensional, biologically grounded approach to psychiatry research.