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Cognitive processing during emotional distraction in Borderline Personality Disorder

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Borderline Personality Disorder (BPD) is a severe mental disorder, characterized by pronounced difficulties in emotion regulation and a hypersensitivity to emotional stimuli. Emotion dysregulation in BPD has been associated with amygdala hyperreactivity and frontal hypoactivation. As another key featue, individuals with BPD show cognitive disturbances including aspects of impulsivity, altered social cognition, and dissociation. One possible link between emotion dysregulation and other key features of BPD might be that states of aversive affective arousal interfere with executive functions, which play a crucial role in goal-directed behavior. In healthy individuals, difficulties in coping with emotional distraction were associated with impaired working memory performance, amygdala hyperreactivity, and decreased activation in prefrontal brain regions. Previous research in BPD suggests that individuals with BPD are even more susceptible to emotional interference compared to healthy participants. However, studies in patients with BPD investigating emotion–cognition interactions on a subjective, behavioral level, and neurobiological level are still needed. Moreover, the role of social perception and dissociation in interference control in individuals with BPD is not yet completely understood.

In the framework of this doctoral thesis, three studies were conducted, which aimed to investigate these research questions. In a first study, a modified version of the *Emotional Working Memory Paradigm* was established in the laboratory. In this study, 28 unmedicated BPD patients and 28 healthy participants performed a working memory task, while being distracted by neutral vs. negatively arousing pictures showing either interpersonal scenes or facial expressions (*Study 1*). As a next step, the *Emotional Working Memory Paradigm* was applied during event-related functional magnetic resonance imaging (fMRI) in 22 un-medicated patients with BPD and 22 healthy participants (*Study 2*). To investigate whether patterns of amygdala activation are already altered in the absence of experimental tasks, a third study was conducted, which employed resting-state fMRI in 20 un-mediated patients with BPD compared to 17 healthy individuals (*Study 3*).

Findings of *Study 1* and *Study 2* point to significant difficulties in suppressing task-irrelevant emotional stimuli in individuals with BPD compared to healthy participants. In *Study 1*, BPD patients additionally showed impaired accuracy, when viewing – both neutral and fearful – distracting faces. In line with findings of *Study 1* and a-priori hypotheses, emotional distraction led to impaired working memory, increased amygdala activation and frontal hypoactivation in BPD patients compared to healthy controls in *Study 2*. Moreover, amygdala activation was negatively correlated with self-reports of dissociative states in patients with BPD suggesting a moderating role of dissociation on limbic activation. Findings of *Study 3* further suggest alterations in resting-state networks that are related to emotion processing, salience detection, and self-referential processing in individuals with BPD compared to healthy controls.

To conclude, research conducted in the framework of this doctoral thesis points to impaired inhibitory control of emotional stimuli and social cues (including neutral facial expressions) in individuals with BPD. The presence of emotionally arousing stimuli and social cues seems to shift attention away from cognitive tasks involving basic executive functions in persons with BPD. Future research should clarify whether cognitive disturbances in BPD patients – including aspects of impulsivity and altered social cognition – are directly caused by emotion dysregulation (e.g. increased affective arousal after an experimental mood induction). In the clinical context, stress tolerance training and training of social competencies (e.g. differentiating ambiguous facial expressions) might help to reduce problems in maintaining task-related attention and goal-directed behavior in individuals with BPD.