**Supplemental Material**

**S1 Group differences in the structural integrity independent of co-morbid PTSD**

To elucidate whether the structural alterations in the uncinate fasciculus (UF) of BPD participants were affected by the presence of posttraumatic stress disorder (PTSD), we compared the structural integrity of the UF between HC participants and BPD participants without co-morbid PTSD (see Figure S1). Mixed-design ANOVAs (group\*hemisphere) revealed lower FA (effect of group: *F*1,40 = 5.90, *p* = 0.02, *ηp2* = 0.13; all other effects involving group or hemisphere: *F* < 3.90, *p* > 0.06, *ηp2* < 0.09) and, at least on a trend level, higher RD (effect of group: *F*1,40= 3.94, *p* = 0.05, *ηp2* = 0.09; all other effects involving group or hemisphere: *F* < 3.26, *p* > 0.08, *ηp2* < 0.08) in the bilateral UF of BPD participants without co-morbid PTSD than in the bilateral UF of HC participants. AD, on the contrary, did not differ in the bilateral UF of BPD participants without co-morbid PTSD and HC participants (effects involving group or hemisphere: *F* < 0.53, *p* > 0.47, *ηp2* < 0.01). A mixed-design ANCOVA (group\*hemisphere) controlling for individual differences in FA or RD revealed similar FA and RD in the bilateral UF of HC participants and BPD participants without PTSD (all effects of group and hemisphere for FA or RD: *F* < 1.75, *p* > 0.19, ηp2 < 0.04). Moreover, correlation analyses revealed a negative relationship between FA and RD in the bilateral UF (all correlations involving the right or leftUF: *r* > |.78|, *p* < .001), suggesting a common pathophysiological process underlying structural alterations in the bilateral UF of BPD participants without co-morbid PTSD.

To determine the specificity of the structural alterations in the UF of BPD participants without co-morbid PTSD, we also compared the structural integrity of the cingulum (CG) between HC participants and BPD participants without co-morbid PTSD (see Figure S1). Mixed-design ANOVAs (group\*hemisphere) revealed similar FA, AD and RD in the CG of HC participants and BPD participants without co-morbid PTSD (effect of group for FA, AD or RD: *F* < 1.82, *p* > 0.19, ηp2 <0 .05; interacting effect of group and hemisphere for FA, AD or RD: *F* < 3.14, *p* > 0.08, ηp2 < 0.07; effect of hemisphere for FA or AD: *F* < 2.68, *p* > 0.11, ηp2 < 0.06; effect of hemisphere for RD: *F*1,40 = 7.67, *p* = 0.01, ηp2 = 0.16; see Figure S1), indicating the specificity of the aforementioned alterations in the bilateral UF of BPD participants without co-morbid PTSD.

According to these analyses, BPD participants showed specific and distinct white matter alterations in the UF, independent of the presence of PTSD. These alterations were probably due to myelin degeneration rather than due to axonal injury as indicated by abnormal FA and RD in the UF of BPD participants ([Song *et al.*, 2003](#_ENREF_7), [Song *et al.*, 2002](#_ENREF_8), [Sun *et al.*, 2006](#_ENREF_9)). Since myelin degeneration has been associated with stress-induced inflammation ([Garcia-Bueno *et al.*, 2008](#_ENREF_1), [Merrill and Benveniste, 1996](#_ENREF_4)), it may be possible that BPD participants’ stressful life experiences contributed to these alterations (e.g., [Lobbestael *et al.*, 2010](#_ENREF_2), [McGowan *et al.*, 2012](#_ENREF_3), [Pagano *et al.*, 2004](#_ENREF_6)). Although these alterations appeared to be unaffected by the presence of co-morbid PTSD, it remains to be determined how trauma exposure and trauma-related symptoms affect the structural integrity of the UF. Studies investigating BPD patients with different degrees of trauma exposure and trauma-related symptoms may help to clarify how stressful life events lead to structural alterations in the UF. Considering that similar alterations are already present in adolescents with BPD features ([New *et al.*, 2013](#_ENREF_5)), it may be worthwhile to investigate BPD participants across the life span in these studies, preferably before and after pharmacologic or psychotherapeutic interventions to determine the impact of these interventions on the structural integrity of the uncincate fasciculus.

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**Supplementary Figure S1.** Structural integrity of the bilateral uncinate fasciculus (UF) and bilateral cingulum (CG). Bars represent mean fractional anisotropy (FA), mean radial diffusivity (RD) and mean axial diffusivity (AD) in the bilateral uncinate fasciculus (UF) and bilateral cingulum (CG) of healthy control (HC) participants and with borderline personality disorder participants without co-morbid posttraumatic stress disorder (BPD-PTSD). Error bars indicate SEM. *\* p* ≤ .05

**Supplemental References**

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