Is trait resilience characterized by specific patterns of attentional bias to emotional stimuli and attentional control?

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Background and objectives: Attentional processes have been suggested to play a crucial role in resilience defined as positive adaptation facing adversity. However, research is lacking on associations between attentional biases to positive and threat-related stimuli, attentional control and trait resilience.

Methods: Data stem from the follow-up assessment of a longitudinal study investigating mental health and related factors among German soldiers. Trait resilience was assessed with the Connor-Davidson Resilience Scale and attentional control with the Attentional Control Scale. A subset of n = 198 soldiers also completed a dot probe task with happy, neutral and threatening faces.

Results: Attentional control was positively related to trait resilience. Results revealed no associations between both attentional biases and trait resilience. However, there was a negative association between attentional bias to threat and trait resilience when attentional control was low and a positive association between attentional bias to threat and trait resilience when attentional control was high. No such associations were found for attentional bias to positive stimuli.

Limitations: Generalizability to other populations may be limited since we exclusively focused on male soldiers. Also, the cross-sectional design does not allow for causal conclusions.

Conclusions: Findings suggest that attentional processing may promote trait resilience. Future research on preventive interventions should consider these findings.

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1. Introduction

Trait resilience is defined as a stress coping ability, which enables individuals to successfully adapt facing adversity (Connor & Davidson, 2003). Empirical evidence has shown that lower levels of trait resilience are associated with an increased risk of developing mental disorders after stressful life events, e.g. PTSD (Lee, Ahn, Jeong, Chae, & Choi, 2014) as well as other anxiety (e.g. Scali et al., 2012), depressive (e.g. Edward, 2005; Kukihara, Yamawaki, Uchiyama, Arai, & Horikawa, 2014), and substance use disorders (Wingo, Ressler, & Bradley, 2014). Furthermore, trait resilience has been shown to predict treatment response in subjects with depression and PTSD (Davidson et al., 2012; Min, Lee, Lee, & Chae, 2012). Even though previous evidence suggests that trait resilience might protect from maladaptive outcomes and might help to recover from stressful life events little is known about cognitive characteristics and underlying mechanisms of trait resilience. This may be of pivotal importance regarding the development of empirical based interventions for promoting resilience.

Theoretical accounts postulate that attentional processing may play a crucial role in trait resilience. Schwager and Rothermund (2013) proposed that attention is the core of cognition and affect,
which is responsible for adaptation in stressful situations. Theories of attention postulate two systems (e.g. Corbetta & Shulman, 2002) which can be related to the concepts of attentional control and attentional bias. Accordingly, attentional bias can be seen as a bottom-up, stimulus-driven attentional process, responsible for the detection and attentional holding of relevant stimuli. Attentional control is described as a top-down process, supposed to be responsible for preparation, regulation and application of goal-directed selective attention.

Even though theoretical accounts suggest that attentional biases to positive and negative stimuli may encourage trait resilience (e.g. responsible for preparation, regulation and application of goal-directed selective attention. Attentional control is described as a top-down process, supposed to be responsible for preparation, regulation and application of goal-directed selective attention. Accordingly, attentional bias can be seen as a bottom-up, stimulus-driven attentional process, responsible for the detection and attentional holding of relevant stimuli. Attentional control is described as a top-down process, supposed to be responsible for preparation, regulation and application of goal-directed selective attention. Therefore, one might assume that it is also involved in trait resilience. Accordingly, Stein, Campbell-Sills, and Gelernter (2009) found a negative association between the number of s-alleles of 5-HTTLPR and attentional bias. Additionally, Perez-Edgar et al. (2010) and Fox, Ridgwell, and Ashwin (2009) found that attentional bias for angry faces was positively associated with the number of long alleles of 5-HTTLPR and the reverse pattern was evident for attentional bias to happy faces. These findings suggest that trait resilience might be positively associated with attentional bias toward positive stimuli and negatively associated with attentional bias toward negative stimuli. However, to our best knowledge no study so far directly examined associations of trait resilience with attentional biases.

Moreover, a better ability to control attention may enable individuals to decide which internal and external stimuli they attend to and thus promote adaptive emotion regulation (Troy & Mauss, 2011). This may support coping with adverse situations. Consistent with this proposition Eisenberg et al. (2004) found that effortful control, a superordinate construct including AC, predicted trait resilience in a longitudinal study in children. Furthermore, Bardeen, Fergus, and Orcutt (2014) found that higher attentional control predicted lower symptoms of PTSD in traumatized individuals compared to non-traumatized individuals. However, to our knowledge research is lacking on examining the relations between attentional control and trait resilience directly.

According to theories about attentional processing attentional control and attentional biases are distinct systems but supposed to interact with each other (e.g. Corbetta & Shulman, 2002; Petersen & Posner, 2012). In line with this, Verwoerd, Wessel, de Jong and Nieuwenhuis (2009) found in a laboratory study that attentional bias and attentional control were related in the prediction of intrusions after watching a trauma film. Furthermore, Bardeen and Orcutt (2011) and Schoorl, Putman, Van Der Werff, and Van Der Does (2014) found that the interaction of attentional control and symptoms of PTSD was associated with attentional bias to threat. Results of the study of Bardeen and Orcutt (2011) using general threat stimuli (whereas Schoorl et al. (2014) used trauma-related stimuli) indicated that participants with strong AC and strong symptoms of PTSD showed attentional avoidance of threat whereas participants with poor AC and strong symptoms of PTSD showed an attentional bias towards threat.

2. Method

Data were collected during the follow-up measurement of the longitudinal component of the study “Prevalence, incidence and determinants of PTSD and other mental disorders” (PIT-PTSD+). A detailed description of the study's methods, design and findings has been published previously (Trautmann et al., 2014; Wittchen et al., 2012).

2.1. Participants

Participants were recruited from the follow-up sample \(n = 383\). \(N = 198\) participants provided complete data sets with all of the measurements used for this study purpose (see below). Six participants had to be excluded because they had answered less than 80% of the trials in the dot probe task correctly. Additionally, we excluded the only female soldier because of empirical evidence suggesting gender differences in attentional biases (Tian, Lamplmayr, Pitzinger, & Pfibigan, 2013) and lack of power. This resulted in a final sample of \(n = 191\) participants. Demographic and clinical characteristics of the sample are displayed in Table 1.

2.2. Self-reported measures

Number of combat-related experiences and traumatic events. Potentially traumatic events according to DSM-IV A1-criterion (American Psychological Association, 2000) were assessed using a list from the military version of the fully standardized diagnostic interview of DIA-X/M-CIDI (Wittchen & Pfister, 1997; Wittchen, et al., 2012).
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