



Attentional control as a prospective predictor of posttraumatic stress symptomatology[☆]



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ABSTRACT

Attentional control may be used by trauma survivors to temporarily disengage and shift attention from threat salient information, allowing individuals to remain in, and habituate to, trauma-relevant contexts rather than using less adaptive regulatory strategies. Thus, greater attentional control abilities may be one factor that differentiates those who recover from trauma exposure from those who do not. In the present study, we examined attentional control as a prospective predictor of posttraumatic (PTS) symptoms over the course of two assessment sessions (T1 and T2). Consistent with the hypothesis that attentional control can be used to alleviate trauma-related distress, we predicted that an inverse relation between T1 attentional control and T2 PTS symptoms would be significantly stronger among participants who had experienced a traumatic event between time points (24% of the total sample; $N = 85$). Pre-T1 trauma history and T1 PTS symptoms served as covariates in regression analysis. Results revealed that T1 attentional control only predicted T2 PTS symptoms for participants who had experienced a traumatic event between time points. Thus, attentional control may be a protective factor against the development of PTS symptomatology in the aftermath of a traumatic event.

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1. Introduction

Although it is not uncommon to experience a traumatic event, only a small fraction of trauma exposed individuals go on to develop posttraumatic stress disorder (PTSD; Breslau & Kessler, 2001). Although a number of pre-trauma risk factors have been suggested in the development of PTSD, a great deal of attention has been paid in the extant literature to information processing biases, with a number of laboratory studies providing evidence that those with relatively higher posttraumatic stress (PTS) symptoms have a bias for attending to threat information (e.g., Bardeen & Orcutt, 2011; Olatunji, Armstrong, McHugo, & Zald, 2013; Pineles, Shipherd, Mostoufi, Abramovitz, & Yovel, 2009). In fact, some have suggested that PTSD is an information-processing disorder, with an emphasis on biased threat perception (van der Kolk & McFarlane, 1996).

In line with this conceptualization, research has shown that prolonged attentional engagement with threat information

maintains negative affective states (Bardeen & Read, 2010; Compton, 2000). Protracted states of distress may subsequently decrease the cognitive resources that are available for the emotional processing of trauma information (Foa & Kozak, 1986), thus resulting in the development and/or maintenance of PTS symptoms. However, popular theories of attentional threat processing (i.e., goal driven/stimulus driven theory: Corbetta & Shulman, 2002; attentional control theory: Eysenck, Derakshan, Santos, & Calvo, 2007; hot/cool-system theory of self-regulation: Metcalfe & Mischel, 1999) suggest that top-down attentional control (AC; i.e., the strategic control of higher-order executive attention in regulating bottom-up, stimulus driven, emotional responses) can be used to strategically avoid threat information in an attempt to alleviate emotional distress. Consistent with these theories, preliminary evidence suggests that AC can be used to disengage and shift attention from PTS-related threat information (Schoorl, Putman, van der Werff, & van der Does, 2014), even among those with relatively higher PTS symptoms (Bardeen & Orcutt, 2011), thus reducing trauma-related distress (Bardeen & Read, 2010). The use of AC to temporarily disengage and shift attention from threat salient information may help to down-regulate sympathetic nervous system arousal, thus allowing one to remain in, and habituate to, trauma-relevant contexts rather than using less adaptive regula-

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tory strategies which have been shown to maintain PTS symptoms (e.g., experiential avoidance; Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011). Thus, AC may be one pre-trauma individual difference factor of particular relevance for understanding the development of PTS symptoms following trauma exposure.

Relatively few published studies have examined AC in the context of PTS symptomatology; however, a number of studies have shown that relatively lower levels of AC are associated with higher levels of a host of maladaptive outcomes, including PTS symptoms (Bardeen & Orcutt, 2011), poor social adaptation and externalizing behaviors (Eisenberg, Fabes, Guthrie, & Reiser, 2000), worry and rumination (Armstrong, Zald, & Olatunji, 2011), and symptoms of hyperactivity and inattention in children (Wiersema & Roeyers, 2009). Interestingly, AC has exhibited a protective effect in examinations of relations between putative risk factors and maladaptive outcomes. Specifically, empirical research has shown that AC protects (a) those who are prone to use maladaptive coping behaviors, such as worry and thought suppression from experiencing higher levels of anxiety (Fergus, Bardeen, & Orcutt, 2012), (b) those who perceive themselves as having poor emotion regulation abilities from ceasing goal-directed behavior when experiencing distress (Bardeen, Tull, Dixon-Gordon, Stevens, & Gratz, in press), (c) those with public-speaking anxiety from decrements in speech performance (Jones, Fazio, & Vasey, 2012), and (d) those with higher levels of trait anxiety from responding with fear to a CO₂ challenge (Richey, Keough, & Schmidt, 2012). Taken together, these findings suggest AC as a transdiagnostic protective factor against the development of maladaptive outcomes, even among those with outcome-specific vulnerabilities.

Findings to date are consistent with Gross's (1998) process model of emotion regulation, in which the ability to flexibly control attention is essential for maintaining psychological well-being. In Gross's model, attention deployment is considered the gatekeeper of emotion regulation, directly influencing subsequent stages of emotion regulation. Thus, the importance of examining the role of pre-trauma AC in the development of PTS symptoms following a traumatic event cannot be overstated, especially given research which has identified dispositional emotion dysregulation as a risk factor for the development of PTS symptomatology following trauma exposure (Bardeen, Kumpula, & Orcutt, 2013).

Although the extant literature has provided evidence suggesting that relatively higher levels of AC may promote psychological well-being, even among those who are vulnerable to experiencing maladaptive psychological outcomes, the cross-sectional nature of research in this area precludes inferences regarding temporal relations among AC and maladaptive outcomes. Thus, in the present study, we examined AC as a prospective predictor of PTS symptoms over the course of two assessment sessions. We hypothesized that AC at the first assessment session (T1) would be negatively associated with PTS symptoms at T1 and at the follow-up assessment session (T2). In addition, we examined exposure to a traumatic event between assessment sessions as a moderator of the relationship between T1 AC and T2 PTS symptoms. Given that increased PTS symptoms are not uncommon in the acute aftermath of trauma exposure, as well as evidence suggesting AC as a protective factor, we expected that an inverse relation between T1 AC and T2 PTS symptoms would be significantly stronger among participants who had experienced a traumatic event between assessment sessions when accounting for pre-T1 trauma history and T1 PTS symptoms. This hypothesis is consistent with theory, and empirical research, which suggests that AC can be used to alleviate trauma-related distress. Thus, among participants who experience a traumatic event, those with higher AC abilities may be significantly less likely to experience PTS symptoms in the acute aftermath of the event.

2. Method

2.1. Participants and procedure

This study was conducted as part of a larger study investigating relations among constructs of distress tolerance, emotion regulation, and emotional distress. Participants were recruited from introductory psychology courses at a Midwestern U.S. University. Over the course of an academic semester, 135 participants completed two assessment sessions. To be included in the present study, participants had to endorse having experienced at least one traumatic event at the first assessment session (i.e., Criterion A of the Diagnostic and Statistical Manual of Mental Disorders [DSM-V-TR]; (American Psychiatric Association [APA], 2000). Forty-eight (36%) participants who did not report experiencing a traumatic event at T1 were excluded from the final sample. Additionally, two cases were removed from analyses because of undue influence on the primary analytic model (i.e., multivariate outliers $>1 DFFITS_i$; Cohen, Cohen, West, & Aiken, 2003). The final sample ($N = 85$; 54 women) had an average age of 19.8 years ($SD = 2.5$) and 72% self-identified as White, 14% as Black, 2% as Asian, 1% as American Indian or Alaska Native, 9% endorsed "other", while 1% preferred not to respond. Additionally, 7% of participants reported being of Hispanic/Latino ethnicity.

For this institutional review board approved study, participants completed a battery of random-ordered questionnaires at each time point. Informed consent and study measures were administered via a secure online survey program. Participants could complete both study sessions from any computer with internet access. Participants were informed that their responses were confidential and that they were free to withdraw from the study at any time. Following completion of each study session, participants were given credit for their introductory psychology course. The interval between T1 and T2 varied ($M = 36.9$ days; $SD = 11.0$; range 26–84 days); over 90% of the sample completed T2 within 25–50 days of T1.

2.2. Measures

The Attentional Control Scale (ACS; Derryberry & Reed, 2002) is a self-report measure that assesses one's ability to flexibly control attention. The 20 items of the ACS are rated on a 4-point scale (1 = *Almost never true of me* to 4 = *Always true of me*), with higher scores indicating relatively better AC abilities. Participants were asked to rate how often, or how much, each statement applies to them in general. The ACS has exhibited adequate psychometric properties, including good internal consistency and concurrent validity (Derryberry & Reed, 2002). Additionally, higher scores are predictive of increased activation in brain areas associated with top-down emotion regulation (Matthews, Yiend, & Lawrence, 2004). Internal consistency for the ACS total score ($M = 53.40$, $SD = 9.71$, range = 21–75) in the present sample was adequate ($\alpha = .85$).

With the goal of reducing participant burden, a brief 7-item self-report questionnaire (Read et al., 2012), which was adapted from the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000), was used to assess a range of Criterion A experiences, including: (1) natural disaster/accident/fire, (2) combat, (3) sudden unexpected death of a loved one, (4) life-threatening illness, (5) physical assault, (6) sexual assault, or (7) other events that were life threatening, caused serious injury, or were highly distressing (example events were provided for this question). From the events reported, participants were asked to identify the one event that they found to be most distressing. Participants completed this measure at both sessions; however; at T2, participants were asked

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