Posttraumatic Stress, Uncontrollability, and Emotional Distress Tolerance

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Abstract

Background: Although individuals with PTSD report poor tolerance for distress, the mechanisms underpinning this are unknown. Cognitive models of PTSD propose that appraisals of lacking or losing control impair adaptation to trauma. This study investigated whether avoidance of emotional distress was affected by loss of control in a web-based community sample with and without PTSD symptomatology, expecting that those with PTSD may show more detrimental effects following greater loss of control.

Methods: PTSD-symptomatic (N = 104) and non-symptomatic (N = 102) participants initially had baseline controllability appraisals indexed during a task designed to induce an illusion of control over an unwanted stimulus. Participants were then randomized to be able to delay the onset and also control the termination of interference trials during an effortful visual search task, and separately randomised to receive pre-task instructions implying either doubtful or certain controllability. Following the manipulation, participants completed a task indexing delay between selecting and playing a purportedly distressing video at their maximum tolerable distress level.

Results: Controlling for age, sex, and instructional condition, those who experienced greater violation of their initial perceptions of control tended to be more avoidant of emotional distress. There was a significant interaction whereby loss of control was more detrimental for those with PTSD symptoms.

Conclusions: These initial data suggest that posttraumatic stress exacerbates sensitivity to loss of control, and this appears to directly impact capacity to approach distressing stimuli.

Keywords: Posttraumatic stress disorder; controllability; perceived control; avoidance

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Implied in the definition of posttraumatic stress disorder (PTSD) is that people with the disorder have difficulties tolerating the distress triggered by trauma reminders, a feature which can be related to other core symptoms including psychological and physiological reactivity, hypervigilance, anger, and avoidance of the reminders (APA, 2013). Consistent with this, there is initial evidence that PTSD is characterized by impairments in managing emotionally charged experiences (Beckham et al., 2000; Marshall-Berenz, Vujanovic, & Zvolensky, 2011; Vujanovic, Bonn-Miller, Potter, Marshall, & Zvolensky, 2011; Vujanovic, Dutcher, & Berenz, 2017), but little evidence pertaining to the mechanisms underpinning this (Vujanovic, Litz, & Farris, 2015). Distress tolerance is defined as the perceived and/or actual capacity to withstand exposure to aversive experiences, such as negative emotions (Simons & Gaher, 2005). One factor possibly influencing this is the perceived capacity to control unwanted events. In nonclinical subjects, perceived control improves distress tolerance in terms of pain (Salomons, Johnstone, Backonja, Shackman, & Davidson, 2007), iced water immersion (Litt, 1988), duration to view emotionally distressing images (Bryant, Felmingham, Das, & Malhi, 2014), moderation of avoidant emotion regulation (Salomons, Nusslock, Detloff, Jonstone, & Davidson, 2015), as well increased tolerance of panic (Sanderson, Rapee, & Barlow, 1989).

The construct of controllability is broad, encompassing both actual and perceived control of either external stressors or internal states. In contrast to the extensive animal literature on controllability of external stressors (Maier, 2015), models of PTSD emphasize the role of perceived control over both aversive external events and internal states. Specifically, cognitive models propose that catastrophic, overgeneralized appraisals, such as the belief that one lacks control, may maintain the disorder by contributing to the sense of ongoing threat or inability to control one's emotional reactions (Ehlers & Clark, 2000; Resick & Monson, 2007). This process may occur without explicit awareness of a triggering event or appraisal, and thus be further interpreted as lacking control over one's emotional reactions, compounding the adverse effects (Ehlers & Clark, 2000). This generally accords with an extensive animal literature indicating the importance of controllability to adaptive regulation of stress responses (Amat et al., 2005; Maier, 2015), as well as the diminished sense of control over one's environment or oneself that is now well documented in PTSD (Chorpita & Barlow, 1998; Grills-Tauchel, Littleton, & Axson, 2011) and predictive of PTSD severity (Ayers, 2007; Dunmore, Clark, & Ehlers, 2001; Kleim, Ehlers, & Glucksman, 2007; Livanou et al., 2002). However, these findings do not examine the extent to which people with PTSD remain sensitised to losing control, which in turn may compromise their capacity to cope with stressful experiences. .

This study aimed to examine the interplay between appraisals of control, experiences of uncontrollability, and distress tolerance in people with PTSD by manipulating loss of control. In recognition that controllability involves an interplay between actual and perceived control over external events, we operationalized controllability as the ability to manage an experimentally-controlled stressor relative to participants' expectations of control. We focused on control over an external stressor, and measured the effects of manipulated control in terms of subsequent avoidance. Specifically, we recruited people with and without PTSD symptomatology and indexed

their differential capacities to approach distressing material after a manipulation in which their baseline appraisals of control over a neutral unwanted cue were either violated or improved upon by actual contingencies. We hypothesized that the PTSD group would be more sensitive to the effects of losing control relative to the no-PTSD group, and therefore be more avoidant of distress after experiencing greater loss of control.

Method

Participants

This study was approved by the University of New South Wales Human Research Ethics Committee (HC12402), and all participants provided informed consent. Two hundred and seventeen US-based Mechanical Turk crowdsourcing workers enrolled in the study via the Mechanical Turk interface. Participants were pre-screened for Criterion A trauma and posttraumatic symptomatology via the Posttraumatic Diagnostic Scale Part 1 to 3 (PDS; Foa, 1995) and were enrolled on the basis of being either PTSD-symptomatic (Criterion A trauma and a score of least 19 on the Posttraumatic Diagnostic Scale; cut-off of 15 is suggested to indicate likely presence of PTSD, Foa, 1995), or controls (PDS of less than 10 and Depression, Anxiety and Stress Scale – Depression index less than 10; Lovibond & Lovibond, 1995). Due to the potential sensitivity of trauma history disclosure, users were assured prior to screening that identifying data would not be collected. Participants were ineligible if they had < 95% approval rate for their work on Mechanical Turk (an indicator of worker reliability), reported being aged under 18 years, or had failed malingering, veracity and attentional checks embedded within the self-report measures (e.g. for Traumatic Events Checklist, endorsing ‘Accidentally falling from a height of 100 metres or more’; endorsing both ‘Happened to me’ and ‘Did not happen to me or anyone I know’ for any traumatic event, or reporting a current location inconsistent with their IP address). As PTSD participants were slower to recruit, the experiment was offered periodically in batches of 50 to disguise the greater likelihood of qualifying in presence of PTSD symptoms that could be potentially revealed by user cross-talk if all control participants were allocated too early. The study listing was viewable only when a batch was running with unfilled allocations in the relevant participant group (PTSD or Control), with approximately 8 Control allocations and unlimited PTSD allocations per batch; this was continued until all PTSD allocations were filled. Additionally, the study listing was also made available to participants who had previously participated in a PTSD study on Mechanical Turk.

Of 1640 potentially eligible pre-screened participants, 58 were ineligible based on symptom criteria, 294 were excluded on the basis of malingering, veracity or attentional checks, 370 were suspected as attempted repeat participation from different accounts (e.g., same i.p. address at consecutive times, up to 34 repeats) and excluded, 428 met criteria but did not qualify due to unavailability of allocations in a current batch, and 490 (331 Controls and 159 PTSDs) qualified for the study. Of these, 217 (44.3%) elected to participate (114 Controls and 103 PTSDs, 34.4% and 64.8%, respectively). The observed elevated prevalence of PTSD symptomatology in the sample can be attributed to our procedure of recruiting from a previous study that had screened for PTSD via

screening questionnaires. Eight control participants discontinued prior to completing the experimental tasks, and two control and one PTSD participant were excluded based on failing inattention and malingering checks, leaving 206 cases for analysis.

Screening measures

Posttraumatic Diagnostic Scale (PDS; Foa, 1995) is a 49-item self-report measure of DSM-IV PTSD symptoms including a checklist of Criterion A traumatic events. The PDS demonstrates excellent internal consistency and shows good agreement with DSM-IV PTSD diagnosed via structured clinical interview (Foa, Cashman, Jaycox, & Perry, 1997) and showed excellent internal consistency in the present sample ($\alpha = .94$).

Depression, Anxiety and Stress Scale – Depression index (DASS-D; Lovibond & Lovibond, 1995) contains 17 items measuring depressive symptoms and shows excellent reliability, convergent and discriminant validity in both clinical and nonclinical samples (Brown, Chorpita, Korotitsch, & Barlow, 1997; Crawford & Henry, 2003) and showed excellent reliability in the present sample ($\alpha = .97$).

Procedure

A summary of the procedure is provided in Figure 1. All tasks were presented on an external website using classic ASP and Javascript on a Microsoft Azure SQL server, which allowed stimulus presentation and response time accuracy to be verified to within two milliseconds. Eligible workers received the option to complete a 'Word Search Games Study' via a web link. Participants were recompensed a minimum of US\$3 into their Amazon accounts. At the conclusion of the experiment, all participants were debriefed and provided with referral information.

As their payment tends to be contingent upon attention to detail and timely completion, Mechanical Turk workers demonstrate superior attentiveness relative to college samples (Hauser & Schwarz, 2016), and there is strong evidence for the validity of clinical and experimental data in this population (for review, see Chandler & Shapiro, 2015; Shapiro, Chandler, & Mueller, 2013). In addition to the pre-screening criteria and validity checks, the following additional measures were taken to support data validity: i) Participants were advised of the importance of completing the experiment attentively without interruptions, required to maximise their browser window and minimise external distractions, and told they could earn a bonus reward of up to \$1.50 contingent upon paying careful attention and completing all tasks satisfactorily, as demonstrated via task performance and attentional checks throughout the experiment; ii) they were given a short time (1 hour) to complete all questionnaires, procedures and experimental tasks before the listing would expire; iii) upon commencement, the experiment automatically maximized in a new browser window, and if users attempted to navigate away, an error message was brought up reminding them of the importance of completing the experiment without interruption; iv) as instruction comprehension is known to affect validity of experimental data on Mechanical Turk (Crump, McDonnell, & Gureckis, 2013), participants were required to read over practice task instructions for at least 20 seconds and correctly answer comprehension questions about them before they could

proceed; v) participants were given opportunity to comment on any difficulties or distractions encountered during the experiment, and told that this would not affect their remuneration.

Illusory control task. To index individual differences in the tendency to appraise control, participants completed a baseline 1.5-minute visual search task requiring them to check off items from an alphabetical list of 38 animal names (black text on white background) depending upon whether they were present in a 34-item randomly ordered ‘endangered species’ list (665 x 886 pixels; black text on yellow background). During the task, participants received visual interference (dark grey text on black background such that text became very difficult to read). Instructions emphasised time restrictions and advised, *‘To make things easier for yourself, you can press the spacebar to extend the next white screen a little longer, and reduce the interference.’* Participants first completed a practice task using a different 5-word word list with correct completion required to proceed.

All participants received 20 instances of interference regardless of keypress. To disguise this and support illusions of control (Langer, 1975; Alloy & Abrahamson, 1979), onset of interference was at randomly generated intervals between 2 and 6 seconds, and then remained for the remainder of each 9-second block. To index baseline appraisals of control, participants were next asked to rate how much control they had to reduce interference by pressing the spacebar (0 = *none*, 100 = *total*) on a percentage slider (0 – 100%). There were no significant group differences in these appraisals (PTSD, $M = 30.34\%$, $SD = 33.44$; Controls, $M = 30.69\%$, $SD = 32.37$, $t_{204} = .076$, *n.s.*)

Controllability manipulation. Participants next completed a proofreading task in which they were required to count the number of spelling, grammar or syntax errors in a 198-word story about college life presented in grey text on black background, 10-point font, again while combatting visual interference (distortion and reduced contrast) with a spacebar press. Participants were randomized to receive either 100% controllability over interference onset and offset via spacebar press, or no controllability. Interference trials occurred in each of 16 11-second blocks. When uncontrolled, onset of interference was at a randomly generated time point between 1-3 seconds from commencement of each block, and offset at the end of the block. When controlled, interference offset immediately, and in addition, interference onset was markedly delayed on the subsequent block to a randomly determined time point between 5.5-9s.

Instructional certainty. In order to control for possible effects of expectancy, the nature of the instructions was also manipulated. Participants in both controllability conditions were randomized to receive pre-task instructions indicating either certain controllability (*‘You can use the spacebar to reduce interference... This will keep the next screen white for a longer time and reduce interference.’*) or doubtful controllability (*‘You can try to use the spacebar to reduce interference... But it’s possible that the spacebar might not work some or all of the time. If it does work, it might keep the next screen white for a longer time and reduce interference.’*) To encourage pressing, reminder text appeared in green at the top of the story that remained readable during interference trials (Certain condition: *‘Pressing the spacebar will keep the screen white longer’*; Doubtful condition: *‘Pressing the spacebar might keep the screen white longer’*). Post-task ratings of error count and description of story content at cessation point were then obtained.

Avoidance task. Participants' delay in viewing a potentially distressing video was operationalized as an index of the tendency to avoid emotional distress. Participants first selected the highest level of distressing content they were willing to view in a subsequent video from 0 ('Video with no distressing content') to 7 ('Video with maximum level of highly distressing content'). Delay between video selection and clicking to commence the video was then recorded. Regardless of their selection, participants later viewed at random one of three non-distressing videos in order to prevent unnecessary distress. No data was collected after presentation of the video.

Manipulation checks. After clicking to play the video and prior to presentation of the video, post-task ratings of controllability were elicited to check the effectiveness of the manipulations on a 100-point scale (0 = *no control*, 100 = *total control*).

Data analysis. To identify contributors to avoidance of watching the distressing video, a hierarchical linear regression was conducted. In order to include the potential influence of violation of baseline appraisals of control, a 'Loss of control' variable was calculated by subtracting each subject's actual controllability condition (0 or 100% of trials) from their baseline illusory control ratings (0 – 100%) such that positive scores represented greater violation of an individual's prior appraisal. In Step 1, the control variable Instructional Certainty was entered, together with sex and age. Age was selected on the basis of a bivariate correlation with distress tolerance, $r = .242$, $p < .001$, and prior evidence of age-related slowing on this task (Hancock & Bryant, 2017). Sex was included to account for the greater prevalence of females in the PTSD group, and evidence of sex differences in LH and other PTSD-related responses (see Shansky, 2015 for review). In Step 2, PTSD group and Loss of control were entered. Finally, in order to examine whether the PTSD group were differentially affected by Loss of control, an interaction term PTSD by (mean-centered) Loss of control was entered.

Results

Participant Characteristics

The final dataset consisted of 206 participants (98 female and 108 male; $M_{age} = 33.30$, $SD = 10.70$), including 104 in the PTSD group and 102 Controls. The PTSD group ranged in symptom severity from 18 to 43 on the PDS ($M = 24.51$, $SD = 6.30$), suggestive of moderate to severe posttraumatic symptomatology (Foa et al., 1997); all of this sample exceeded the cut-off score of 15 suggestive of PTSD diagnosis in community samples (Sheeran & Zimmerman, 2002), and 96 (92%) also met symptom count criteria for DSM-IV PTSD criteria B to D (Mean total symptom count, 13.5). Controls ranged from 0 to 9 on the PDS ($M = 3.74$, $SD = 2.74$). The PTSD group also showed moderate depressive symptomatology, consistent with clinically presenting samples ($M_{PTSD} = 19.74$, $SD = 10.7$; $M_{Controls} = 3.2$, $SD = 2.9$). Participant characteristics by group and condition are presented in Table 1. Separate 2 (condition) by 2 (condition) ANOVAs did not indicate systematic differences in age, mean number of trauma experiences, depression or PTSD symptoms between the controllability or instructional conditions.

Manipulation and Attention Checks

Post-task ratings indicated that those in the Uncontrollability condition were aware they lacked control ($M_{\text{Uncontrollable}} = 16.53\%$, $SD = 25.01$) and differed from the Controllability condition ($M_{\text{Controllable}} = 54.90\%$, $SD = 34.04$; $MD = 38.37\%$, $t_{204} = -9.191$, $p < .05$). There was no systematic difference in perceptions of control between instructional conditions ($M_{\text{Certain}} = 39.85\%$, $SD = 38.114$; $M_{\text{Doubtful}} = 32.33\%$, $SD = 32.5$; $MD = -7.52\%$, $t_{204} = -1.53$, ns). Successful word identification during the illusory control (word search) task ($M = 13.32$, $SD = 5.14$) was not different between groups ($MD_{\text{Control-PTSD}} = 1.25$, $n.s.$). Users provided accurate free-text descriptions of the story and error counts during the manipulation (proofreading) task, suggesting adequate attention and task comprehension. Mean press rate was equivalent between groups for the illusory control task ($M_{\text{PTSD}} = 3.97$, $SD = 4.423$, $M_{\text{Controls}} = 3.48$, $SD = 4.833$, $t_{204} = -.761$, ns) and the manipulation task ($M_{\text{PTSD}} = 15.76$, $SD = 6.397$, $M_{\text{Controls}} = 14.70$, $SD = 6.80$, $t_{204} = -1.156$, ns).

Predictors of Avoidance

As shown in Table 2, Age was a moderate predictor of avoidance in the initial model. PTSD group and loss of control together accounted for significant additional variance, $\Delta R^2 = .025$, $F_{2,202} = 1.36$, with Loss of control being a unique predictor, $\beta = .140$, $p < .05$. The interaction of interest, Loss of control by PTSD, significantly added to the model, $\Delta R^2 = .023$, $F_{1,201} = 4.45$, $p < .05$, and was a moderate unique predictor of avoidance, $\beta = .326$, $p < .05$. As shown in Figure 2, the positive interaction coefficient indicates that those with PTSD showed greater influence of loss of control on avoidance at higher levels of loss of control. There were conditional simple effects of PTSD and age over and above the interaction effect, $\beta = .180$ and $.227$ respectively, $p < .05$.

Post-hoc tests

Since depression is highlighted within LH theories of controllability and associated with reduced perceived control (Seligman, 1974; Allan, Siegel & Hannah, 2007), and given that depression was both elevated within the PTSD group, and correlated with avoidance at the bivariate level in our sample ($r = .156$, $p = .025$), the possible role of depressive symptoms in the observed interaction was explored by conducting a further regression of age, instructional certainty and loss of control on avoidance in the PTSD group only, adding depression in a final step. This added to the model, $\Delta R^2 = .043$, $p = .024$, and was a unique predictor of avoidance, $\beta = .217$, $p = .024$, however the influence of loss of control remained, $\beta = .217$, $p = .019$. That is, loss of control and depression were both predictors of avoidance of the distressing stimulus in PTSD participants.

Discussion

This study investigated PTSD-related abnormalities in terms of controllability, and specifically whether violating perceptions of control contributes to avoidance of potentially distressing experiences. Overall, the finding that PTSD-symptomatic participants who experienced greater violation were more avoidant of a subsequent stressor while their asymptomatic counterparts were not suggests that individuals with PTSD may be differentially sensitive to diminished control. Recent findings by our laboratory have indicated a similar sensitivity whereby individuals with PTSD symptoms tended to be more avoidant of emotional distress than controls

after being led to believe they lacked control over aversive images on an earlier task (Hancock & Bryant, 2017), consistent with cognitive models highlighting controllability appraisals in PTSD (Ehlers & Clark, 2000; Resick, Monson, & Chard, 2016). It is well-established that uncontrollability beliefs tend to accompany and predict PTSD (Dunmore, Clark & Ehlers, 2001), but these are some of the first indications of an association between controllability experiences of people with PTSD in terms of impaired behaviour on a subsequent task. This suggests that uncontrollability beliefs may play an active role in dysfunction.

Ehlers and Clark (2000) propose that losing one's sense of control is central to PTSD development, and that the generalization and persistence of this appraisal, among others, maintains the sense of current threat, difficulty regulating negative affect, and over-reliance on avoidant emotion regulation strategies, such as behavioural avoidance. According to this model, activating such beliefs via a specific experience violating controllability appraisals may temporarily heighten avoidance of emotional distress in those with PTSD because of difficulty regulating the resultant negative affect and/or activation of the associated catastrophic schema. It is also possible that the PTSD group found losing control more threatening, triggering arousal that compromised cognitive resources, thereby leading to a behavioral delay. The present finding is also potentially consistent with theories that emphasise the critical role of uncontrollability in fear learning (Foa, Huppert, & Cahill, 2006; Kushner, Riggs, Foa, & Miller, 1993; Mineka & Zinbarg, 2006). Emotional processing theory (Foa et al., 2006) proposes that unrealistic uncontrollability cognitions are represented within a 'pathological fear structure' that is reciprocally linked with 'response' elements, such as avoidance of associated stimuli. Our finding is the first indication that manipulating the experience of control can exaggerate subsequent avoidance behaviour, and that this effect is specifically linked to the presence of PTSD symptomatology, consistent with activation of such a PTSD-specific fear structure.

The observed effects on behaviour towards emotional distress are generally in line with increasing evidence for the involvement of controllability in the cognitive regulation of emotion via top-down regulation of the stress response (Maier, 2015; Salomons, Nusslock, Detloff, Johnstone, & Davidson, 2014); and in particular distress tolerance (Bryant et al., 2014; Litt, 1988). Normal participants would presumably not rely on this network under our experimental conditions due to the nonthreatening nature of the stimuli, while as noted above, those with PTSD may be predisposed to perceive losing control as threatening in itself, and in addition experience an ongoing sense of threat. For some of those with PTSD, then, the disorder may lead to a pathologically increased reliance on sustaining one's sense of controllability in order to maintain distress tolerance capacity.

It is perhaps counter-intuitive that those with PTSD who initially reported appraising *more* control under ambiguous conditions tended to be vulnerable to poorer outcomes when they subsequently lacked control, these being the participants with greatest 'loss'. Although illusory control is broadly adaptive (Alloy & Abramson, 1979), this may depend on both context and the mechanism by which illusions are generated (McKay & Dennett, 2009). In normal subjects, threatening cues such as mortality salience appear to temporarily inflate illusory control (Willis, Tapia-V, & Martínez, 2011), suggesting a compensatory function, and reporting greater control over

past, present and future stressors that are objectively uncontrollable has been linked to poorer adjustment (Frazier & Caston, 2014). Those with OCD show higher illusory control on tasks permitting greater response frequency (Reuven-Magril, Dar, & Liberman, 2008), but lower illusions when response frequency is held constant (Gillan et al., 2014). In PTSD, an inflexible positive appraisal that is discrepant from reality may be linked to an equally extreme underlying negative schema for which it compensates (Beck & Haigh, 2014; Resick et al., 2016; e.g., 'I need to be totally in control at all times... or I can't breathe', Sobel, Resick, & Rabalais, 2009 p.7). Our finding suggests that such individuals may experience vulnerability when exposed to strongly disconfirmatory experiences, such as the uncontrollable condition that violated their prior illusions.

It is important to note that depression was also a significant predictor of avoidance of distress in this sample. As noted in many studies of learned helplessness and depression, depressive states are often characterized by a sense of diminished control over outcomes (Allan et al., 2007), and so it is not surprising that we found that depression predicted avoidance. It is possible that depression secondary to trauma exposure may heighten trauma survivors' sense of helplessness and sensitize them to the effects of lacking control. The relative contributions of PTSD and depressive symptoms to sensitivity to lacking control could be investigated in future studies by including depressed non-PTSD and depressed non-trauma-exposed groups.

Clinical applications

Factors influencing distress tolerance are of potent clinical interest in this population, given its adverse effects on treatment response and compliance and its centrality in various treatment approaches (Schnyder et al., 2015). The present result suggests some clients may present with an excessive and rigid need for controllability that may present quite differently to overt helplessness. This might mask difficulties related to perceived control at times, yet reduce the capacity to cope with post-trauma life events that are perceived as controllability threats due to the excessive impact of peri-traumatic appraisals of losing control. If not addressed, the client may continue to have intermittent difficulty approaching and managing distress and select maladaptive strategies in both life and therapy. This would prevent update in the poorly contextualised trauma memory and sustain maladaptive trauma-related beliefs (Ehlers & Clark, 2000), or according to Emotional Processing Theory, limit opportunities for new learning that competes with the fear structure (Foa & Cahill, 2001). Conversely, the present finding would support providing clinical conditions that sustain the sense of control and/or interventions (e.g. cognitive restructuring) to develop more flexible beliefs about control, as this might promote the capacity to process distressing material and tolerate exposure.

Limitations and future directions

The present study was subject to various limitations. Although numerous measures were taken to ensure veracity and reliability of self-reports, the online format did not allow verification of trauma history or diagnostic status. The Mechanical Turk population has strong evidence as a valid and reliable source of clinical data (Chandler & Shapiro, 2016), however, findings may not generalise to clinically presenting populations or populations outside the US, and this would be a question for

future research. It is possible that unassessed features of the PTSD sample such as sociodemographic factors, comorbidity (e.g., substance abuse), or other traits related to perceived control might play a role in the observed effects. Future studies should examine these possibilities. There are also a number of procedural limitations in using Mechanical Turk. For example, for ethical reasons we did not use the choice of distressing film that participants chose to be exposed because we did not actually present these films, and it was deemed unreasonable to deceive participants by having them choose a film they would not see. Further, exposure to significant emotional distress was implied but not used in this study due to ethical concerns about appropriately debriefing via the online system; future studies could examine controllability in relation to other aspects of distress tolerance requiring such exposure, such as duration before terminating a distressing stimulus, concurrent heart rate variability, and use of avoidant emotion regulatory strategies during stimulus presentation. This cross-sectional study precludes delineating the extent to which sensitivity to loss of control is a vulnerability factor for developing PTSD, a function of PTSD symptoms, or a contributor to PTSD maintenance; prospective studies would be needed to disentangle these possible roles of perceived controllability in PTSD. Finally, the result is preliminary and utilises some relatively novel tasks. Further work on both controllability and distress tolerance in PTSD would help interpret these findings. In particular, there is a need for experimental research examining the effects of controllability on regulation of emotion and responses to aversive stimuli in those with PTSD to support key concepts within current clinical models. Treatment outcome studies assessing whether such sensitivities precede or follow treatment response may further illuminate the role of controllability appraisals and could directly inform enhancements to existing interventions. Future studies could also examine the role of other cognitive factors, such as predictability.

Conclusion and relevance

The present study sought to examine the extent to which events violating prior appraisals of control would lead to greater avoidance of emotional distress in those with PTSD symptomatology. Results support the relevance of appraisal processes and specifically appraisals of control to psychological impairments in this population, and indicate that those with PTSD may be abnormally sensitive to experiences that threaten perceived control. Although previous research has linked self-reported global and trauma-specific appraisals of uncontrollability to poorer concurrent and subsequent outcomes in PTSD, this is one of the first indications that those with PTSD are more adversely affected by activating or manipulating such appraisals, and represents the first evidence linking these appraisals with avoidance of emotional distress in PTSD. This provides initial support for cognitive models emphasising the importance of controllability appraisals for emotion regulation in people with posttraumatic stress (Ehlers & Clark, 2000), and highlights the need for further experimental research to explore cognitive influences on the capacity to tolerate emotional distress in this population.

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Figure 1. Overview of procedure

Figure 2. Mean Avoidance for low (< 0) and high (≥ 0) Loss of control by group

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Table 1.

Mean Participant Characteristics, Sex and Trauma History by Group and Condition

	PTSD-symptomatic group (PTSD > 18)		Control group PTSD <10 & Depression <10	
	Controllable N = 53	Uncontrollable N = 51	Controllable N = 52	Uncontrollable N = 50
Age	33.51 (10.76)	33.19 (10.57)	32.31 (10.05)	34.33 (11.65)
PTSD severity (PDS)	25.72 (6.62)	24.25 (5.78)	3.12 (2.76)	2.43 (2.65)

Depression (DASS)	18.98 (11.39)	20.49 (10.54)	3.71 (3.00)	2.82 (2.84)
Female (%)	40.4	54.9	40.4	32.0
Trauma History (%)				
No trauma	0	0	44.2	28.0
Assault/ combat	71.7	72.5	65.4	52.0
	69.8	60.8	63.5	62.0

Accident				
Disaster	58.5	52.9	55.8	40.0
Domestic abuse	60.4	66.7	43.4	30.0
Child abuse	52.8	58.8	32.7	32.0
Sexual assault	43.4	64.7	36.5	38.0
Number of trauma exposures	5.5 (3.0)	5.5 (2.8)	1.6 (2.4)	2.3 (2.5)

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Note. Standard deviations appear in parentheses. PDS = Posttraumatic Diagnostic Scale. DASS = Depression Anxiety Stress Scale.

Table 2.

Hierarchical Linear Regression Analysis Predicting Choice of Level of Distressing Video

Predictor	ΔR^2	<i>Beta</i>	<i>t</i>	<i>p</i>
Step 1	.062			
Instructional certainty		.06	.84	.40
Age		.24	3.52	< .01*
Step 2	.025			
Instructional certainty		.07	1.07	.41
Age		-.11	3.31	< .01*
Loss of control		.14	2.07	.04*
PTSD		.13	1.92	.06
Step 3	.023			
Instructional certainty		.06	.96	.34
Age		.23	3.40	< .01*
Loss of control		-.15	-1.02	.31
PTSD		.18	2.57	.01*
Loss of Control x PTSD		.33	3.40	.03*

Note. Positive coefficients indicate greater avoidance. * $p < .05$.

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