Intolerance of Uncertainty as an Underlying Factor in the Relationship Between Posttraumatic Stress, Mood, and Generalized Anxiety Symptoms

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Introduction

◆ Intolerance of uncertainty (IU) is a dispositional characteristic associated with negative beliefs about uncertainty over future events (i.e., prospective IU) and behavioral responses to uncertainty (i.e., inhibitory IU).

◆ Inhibitory IU has been independently associated with posttraumatic stress disorder (PTSD) and major depressive disorder (MDD), and prospective IU has been independently associated with generalized anxiety disorder (GAD), beyond the effects of relevant covariates such as anxiety sensitivity (AS), age, and gender.

◆ Despite evidence for the high comorbidity of PTSD with mood and anxiety disorders, and the associations of IU with PTSD, MDD, and GAD, limited research has investigated the interrelationship between IU, PTSD, and comorbid disorders. The present study was designed to examine the relationship of IU scores with MDD and GAD symptoms, after accounting for variance due to comorbid PTSD symptoms and other relevant covariates, in a trauma-exposed sample.

◆ Hypotheses:
  ◆ IU scores were hypothesized to be positively related with higher MDD and GAD symptom scores beyond AS, age, gender, time since trauma, and PTSD symptoms.
  ◆ Inhibitory IU was hypothesized to have a stronger positive association with MDD symptoms than prospective IU, whereas prospective IU was hypothesized to have a stronger positive association with GAD symptoms than inhibitory IU.

Methods

◆ A total of 341 trauma-exposed community adults (51.6% men; M_{age} = 47.59, SD = 12.74) completed self-report measures online. Participants' most commonly experienced index traumas were life threatening illness/injury (17.3%), and transportation accident (13.5%).

◆ Participants' completed the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013), Life Events Checklist-5 (LEC-5; Weathers et al., 2013), Centre for Epidemiological Studies-Depression Scale-14 item (CES-D-14; Carleton et al., 2013), Generalized Anxiety Disorder 7-item scale (GAD-7; Spitzer et al., 2006), Intolerance of Uncertainty Scale, Short Form (IUS-12; Carleton et al., 2007a), and the Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007).

◆ Hierarchical multiple regressions were used to assess the relationships between IUS-12 inhibitory and prospective subscale scores and CES-D-14 and GAD-7 total scores, accounting for ASI-3 total scores, age, gender, time since trauma, and PCL-5 total scores. Model steps were reversed to assess whether IUS-12 scores accounted for significant variance in GAD-7 and CES-D-14 total scores, regardless of their position in the model (Step 1 or Step 3). Analyses were bootstrapped using 2,000 samples.

◆ Hayes PROCESS macro was used for mediational analyses in order to assess how much of the relationship between PCL-5 total score and CES-D-14 and GAD-7 symptoms was accounted for by IUS-12 inhibitory and prospective subscale scores.

Results

◆ Participants' descriptive statistics for MDD, GAD, and PTSD symptoms are presented in Table 1. The table also includes mean time since index trauma and mean AS scores, as well as mean IU total, inhibitory, and prospective IU scores.

◆ IUS-12 scores accounted for 47% of the variance in CES-D-14 total scores when entered into Step 1 of the model (p < .001; Table 2).
  ◆ In the final model IUS-12 inhibitory subscale scores were positively associated with CES-D-14 total scores; however, IUS-12 prospective subscale scores were not significantly associated with CES-D-14 total scores.

◆ IUS-12 scores accounted for 52% of the variance in GAD-7 total scores when entered into Step 1 of the model (p < .001; see Table 3).
  ◆ In the final model, IUS-12 inhibitory subscale scores were positively associated with GAD-7 total scores; however, IUS-12 prospective subscales scores were not significantly associated with GAD-7 total scores.

◆ Results of all mediation analyses are presented in Figure 1.
  ◆ IUS-12 inhibitory (R^2 = .54, p < .001) and prospective (R^2 = .46, p < .001) subscale scores were indirectly associated with CES-D-14 total scores through PCL-5 total scores.
  ◆ IUS-12 inhibitory (R^2 = .61, p < .001) and prospective (R^2 = .55, p < .001) subscale scores were indirectly associated with GAD-7 total scores through PCL-5 total scores.

Discussion

◆ IU was significantly associated with MDD and GAD symptoms in a trauma-exposed sample, even after accounting for AS, age, gender, time since trauma, and PTSD symptoms.
  ◆ Inhibitory IU accounted for significant variance in MDD and GAD symptoms; however, prospective IU did not.
  ◆ Inhibitory and prospective IU were both indirectly related to MDD and GAD symptoms through PTSD symptoms.

◆ The current results may have important implications within the context of trauma-informed clinical interventions.
  ◆ Transdiagnostic treatments targeting IU may be effective to address comorbid symptoms of GAD, MDD, and PTSD.
  ◆ Given the difference in patterns of association between inhibitory and prospective IU, behavioral treatment interventions (e.g., behavioral activation or exposure-based treatments) may be more helpful than cognitive interventions to decrease MDD and GAD symptoms in trauma-exposed individuals with comorbid PTSD symptoms.

◆ The present study was cross-sectional in nature and based on retrospective self-reports from a community sample. Future researchers would benefit from exploring the predictive utility of inhibitory and prospective IU longitudinally in clinical samples. The results would help to advance the development of transdiagnostic treatment protocols for trauma-exposed populations specifically.

Table 1. Descriptive Statistics

	M (SD)
CES-D-14 Total	16.13 (10.07)
GAD-7 Total	7.30 (5.94)
IUS-12 Total	32.12 (11.65)
IUS-12 Prospective	20.36 (6.77)
IUS-12 Inhibitory	11.76 (5.57)
PCL-5 Total	27.54 (19.77)
Time Since Trauma (years)	8.61 (12.09)
ASI-3	21.55 (17.45)

Note. CES-D-14 = Centre for Epidemiological Studies-Depression Scale-14; Generalized Anxiety Disorder 7-item scale; Intolerance of Uncertainty Scale, Short Form; PCL-5 = PTSD Checklist for DSM-5; ASI-3 = Anxiety Sensitivity Index-3.

Table 2. Hierarchical Regression Model for CES-D-14 Total Scores

Model step	Constant	Model step statistics (IVs reversed) Adjusted R^2	β	p	95% CI	r	Part r
1 (3)	Prospective IU	.47 (.37)***	0.04	.699	[-0.15, 0.25]	.55	.02
	Inhibitory IU		1.21	.000	[0.94, 1.46]	.69	.42
2 (2)	Prospective IU	.53 (.50)***	-0.01	.945	[-0.18, 0.19]	.55	-.00
	Inhibitory IU		0.79	.000	[0.51, 1.07]	.69	.23
	ASI-3 Total		0.19	.000	[0.12, 0.26]	.65	.23
	Age		-0.04	.173	[-0.10, 0.02]	-.17	-.05
	Gender		-1.24	.105	[-2.79, 0.15]	-.13	-.06
	Time Since Trauma		0.05	.168	[-0.02, 0.11]	.05	.05
3 (1)	Prospective IU	.56 (.56)***	-0.00	.964	[-0.18, 0.18]	.55	-.00
	Inhibitory IU		0.68	.000	[0.41, 0.96]	.69	.20
	ASI-3 Total		0.13	.000	[0.05, 0.20]	.65	.14
	Age		-0.04	.221	[-0.10, 0.02]	-.17	-.04
	Gender		-0.77	.303	[-2.29, 0.60]	-.13	-.04
	Time Since Trauma		0.05	.152	[-0.02, 0.10]	.05	.05
	PCL-5 Total		0.12	.000	[0.06, 0.19]	.61	.18

Note. CES-D-14 = Centre for Epidemiological Studies-Depression Scale-14; IU = intolerance of uncertainty; ASI-3 = Anxiety Sensitivity Index-3; PCL-5 = PTSD Checklist for DSM-5; CI = confidence interval; B = unstandardized beta-weight.
*** = p < .001 (two-tailed)

Table 3. Hierarchical Regression Model for GAD-7 Total Scores

Model step	Constant	Model step statistics (IVs reversed) Adjusted R^2	β	p	95% CI	r	Part r
1 (3)	Prospective IU	.52 (.44)***	0.09	.134	[-0.02, 0.20]	.60	.06
	Inhibitory IU		0.70	.000	[0.55, 0.82]	.72	.40
2 (2)	Prospective IU	.59 (.57)***	0.04	.394	[-0.06, 0.15]	.60	.06
	Inhibitory IU		0.44	.000	[0.28, 0.59]	.72	.22
	ASI-3 Total		0.12	.000	[0.08, 0.17]	.69	.25
	Age		-0.01	.609	[-0.04, 0.02]	-.17	-.02
	Gender		-0.93	.011	[-1.66, -0.19]	-.15	-.08
	Time Since Trauma		-0.03	.103	[-0.07, 0.01]	-.05	-.06
3 (1)	Prospective IU	.63 (.63)***	0.05	.358	[-0.05, 0.14]	.60	.03
	Inhibitory IU		0.37	.000	[0.22, 0.51]	.72	.18
	ASI-3 Total		0.08	.000	[0.04, 0.12]	.69	.14
	Age		-0.00	.785	[-0.03, 0.03]	-.17	-.01
	Gender		-0.60	.095	[-1.28, 0.06]	-.15	-.05
	Time Since Trauma		-0.03	.089	[-0.07, 0.00]	-.05	-.06
	PCL-5 Total		0.09	.000	[0.06, 0.12]	.67	.21

Note. GAD-7 = Generalized Anxiety Disorder 7-item scale; IU = intolerance of uncertainty; ASI-3 = Anxiety Sensitivity Index-3; PCL-5 = PTSD Checklist for DSM-5; CI = confidence interval; B = unstandardized beta-weight.
*** = p < .001 (two-tailed)

Figure 1. Mediation analysis results of inhibitory and prospective IU with GAD-7 and CES-D-14 total scores. *** p < .001 (two tailed)

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