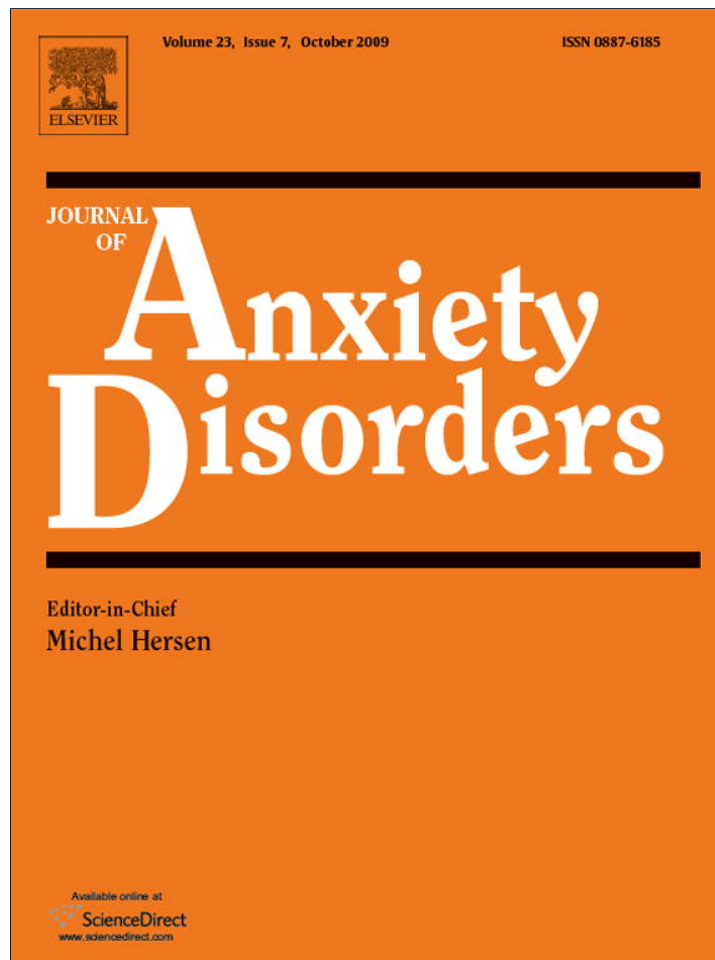


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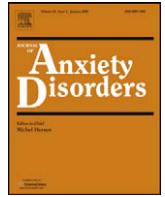
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## Post-trauma symptoms following indirect exposure to the September 11th terrorist attacks: The predictive role of dispositional coping

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## ABSTRACT

Few data prospectively address the role of coping in the development of PTSD. In the present study, 308 undergraduates were assessed for coping prior to the 9/11 WTC attack and for PTSD symptomatology at one and three-months post-9/11. Multiple regression analyses indicated that emotion-focused coping was predictive of increased symptomatology at Month 1 and Month 3, whereas problem-focused and avoidance-focused coping were not. Specifically, analyses predicting PTSD symptom factors (Intrusions, Avoidance, Dysphoria, and Hyperarousal) indicated that greater emotion-focused coping predicted increased Dysphoria symptoms at both time points and, among females, increased levels of Hyperarousal symptoms at Month 1. The role of coping style in the development of PTSD symptomatology and its clinical implications are discussed.

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Over the last few decades, our knowledge of functioning after a trauma has increased significantly. Post-trauma coping styles may play an important role in mediating subsequent psychological symptoms (e.g., DeRoma et al., 2003; Endler & Parker, 1990; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). Coping generally is conceptualized as a conscious response or reaction to external stressful or negative events (e.g., Endler & Parker, 1993; Kohn, Hay, & Legere, 1994). Three broad dimensions are commonly identified within the literature. First, emotion-focused coping includes efforts to regulate distressing emotions associated with the threat using strategies such as rumination or self-blame. Second is problem-focused coping, which is characterized by engaging in activities aimed at solving, altering or mentally restructuring the problem. Third, avoidance-focused coping includes efforts to remove oneself mentally or physically from the situation (e.g., Billings & Moos, 1981; Carver, Scheier, & Weintraub, 1989; Endler & Parker, 1990; Lazarus & Folkman, 1984). Several studies suggest greater report of avoidance and emotion-focused coping strategies predicts greater concurrent post-trauma symptoms (e.g., Bryant & Harvey, 1995; Hyer, M, Boudewyns, & Sperr, 1996; Silver et al.,

2002; Valentiner, Foa, Riggs, & Gershuny, 1996; Gil, 2005), while problem-solving strategies foster adaptive functioning (e.g., Dirkzwager, Bramsen, & van der Ploeg, 2003). The retrospective nature of coping assessment in these studies limits the conclusions that can be drawn from these findings, in that it is difficult to ascertain whether coping style affects reactions following a traumatic event, in particular the development of PTSD, or if development of PTSD affects the coping style reportedly used.

Though our understanding of post-trauma coping and post-traumatic stress disorder (PTSD) has grown, our knowledge regarding the relationship between pre-trauma coping style and the development of PTSD symptomatology is limited. This is not surprising since prospective studies are particularly hard to conduct given the unexpected nature of traumatic events. However, knowing how dispositional coping is related to the onset of PTSD symptoms is important for fully understanding how coping style may serve either as a protective function or as a risk factor.

To date, only one study has been published that examines the role of coping in the development of PTSD using a prospective design. Gil (2005) examined the role of individual coping styles in predicting PTSD in 81 undergraduate students exposed to a terrorist explosion on a bus near their university. In this sample, 62% did not directly witness the explosion but were in the university environment (indirect exposure). Greater emotion-focused and avoidance-focused coping pre-terrorist attack significantly predicted the subsequent diagnosis of PTSD one month later (Gil, 2005). These results are consistent with retrospective

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research showing that emotion-focused and avoidance-focused coping are related to PTSD.

Although there appears to be some consistency between Gil's (2005) prospective results and retrospective findings (e.g., Galea et al., 2003; Hyer et al., 1996; Silver et al., 2002), there is a clear need for additional prospective studies to further understand the relationship between coping strategies and post-trauma symptoms. Leading cognitive-behavioral theories of PTSD (Foa & Kozak, 1986; Horowitz, 1986) suggest that avoidance plays a major role in the development and maintenance of PTSD, thus a dispositional avoidance-focused coping style might predict greater PTSD symptom development after a traumatic event. Furthermore, cognitive models of PTSD state that emotion-focused coping styles, such as rumination, worry and self-blame, may hinder recovery (Ehlers & Clark, 2000). As such it is possible that dispositional emotion-focused coping styles might predict later development of PTSD symptoms following exposure to a traumatic event. It is less clear from these theories how problem-focused coping styles might play a role in PTSD development. More prospective work could clarify if specific dispositional coping styles may predispose individuals toward developing PTSD following a traumatic event (Blake, Cook, & Keane, 1992; Sharkansky et al., 2000).

The 9/11 terrorist attacks offer an opportunity, albeit an unfortunate one, to examine exposure to a traumatic event. In particular, not only did tens of thousands of people witness the event directly but also many individuals were exposed to the event indirectly via extensive media coverage (e.g., Schuster et al., 2001; Silver et al., 2002). Following the 9/11 attacks, there has been an effort to examine the psychological effects of direct and indirect exposure to these events via telephone and web-based surveys (Galea et al., 2003; Schlenger et al., 2002; Silver et al., 2002), with results showing that the prevalence of probable PTSD diagnosis was 11.2% among individuals who were directly exposed to the 9/11 attacks (e.g., witnessed it directly) and 4.0% among individuals who were indirectly exposed (e.g., watched media coverage). Importantly, although post-trauma symptoms decreased over time, a proportion of individuals continued to report notable symptoms six months following indirect exposure to the events (5.8%, Silver et al., 2002). These results are consistent with studies examining post-trauma reactions following indirect exposure to other man-made disasters such as the bombing of the Murrah Federal Building in Oklahoma City (e.g., Morland, 2000; Pfefferbaum et al., 2000).

The current report examines to what extent dispositional (i.e., trait) coping strategies, assessed before the 9/11 terrorist attacks on the World Trade Center (WTC), predict symptoms of post-traumatic stress one and three months post-9/11 in a sample of indirectly exposed participants. Based on prior research, it was hypothesized that individuals who reported using more emotion- and avoidance-focused strategies to cope with stressors prior to the 9/11 attacks would report more post-trauma reactions than individuals who reported using less of these strategies (e.g., DeRoma et al., 2003; Gil, 2005; Hyer et al., 1996; Silver et al., 2002). Based on prior studies, it is not clear how problem-focused coping affects the development of post-trauma reactions.

Prior literature has noted sex differences in both the development of PTSD after trauma exposure (Brewin, Andrews, & Valentine, 2000) and in coping styles. Specifically, females are more likely to develop PTSD after a traumatic event and to report greater use of emotion- and avoidance-focused coping strategies and less use of problem-focused coping compared to males (e.g., Endler & Parker, 1990; Matud, 2004). Thus, the current study will examine if sex moderates the relationship between coping and post-trauma symptoms. Additionally, because the existence of previous trauma exposure has been noted as a risk factor for the development of PTSD (e.g., Brewin et al., 2000), this variable also was included.

## 1. Method

### 1.1. Participants and procedure

Participants were recruited from introductory psychology courses at a large state university in Western New York. In large testing sessions, participants completed a questionnaire packet that included the Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1999) as screening for an unrelated study. Out of the total sample ( $n = 1353$ ), 341 participants completed the CISS prior to the 9/11 terrorist attacks (i.e., on September 10th 2001 and at 8 am September 11th 2001). Independently, 528 students from the same population completed the Post-traumatic Diagnostic Scale (PDS, Foa, Cashman, Jaycox, & Perry, 1997) revised to reflect symptomatology related to 9/11, a demographic questionnaire, and a checklist examining prior traumatic life experience approximately one month (October 5th and 11th) and three months (December 6th and 7th) after 9/11 for a separate project (Baschnagel, O'Connor, Colder, & Hawk, 2005). At both time points, the assessment was conducted at the end of a lecture period in each of three course sections. The current sample of 308 participants completed both the pre-9/11 CISS and the two post-9/11 PDS assessments. Students received experimental credits for their participation. All participants provided informed consent and all procedures were approved by the University at Buffalo Behavioral Sciences Institutional Review Board.

Using the Mahalanobis distance test, three multivariate outliers were detected. As recommended by Tabachnick and Fidell (2001), these outliers were removed. Cases with missing data were removed from the sample via listwise deletion, resulting in a final sample of 305 participants. The sample was evenly split on sex (52% women), with an average age of 19 ( $S.D. = 2.4$ ). The majority of the sample self-identified as Caucasian (71%), with 11% Asian, 8% African-American, 3% Hispanic, 4% other, and 3% missing race information.

### 1.2. Measures

#### 1.2.1. Coping inventory for stressful situations (CISS)

The CISS assessed dispositional coping (i.e., how individuals "generally" cope with stressful situations; Endler & Parker, 1999). This self-report measure consists of 48 items, which assess the three coping dimensions (emotion-, avoidance-, and problem-focused). Respondents indicate on a 5 point scale, ranging from "not at all" to "very much", to what extent they engage in certain types of activities when encountering a difficult, stressful, or upsetting situation. The CISS has shown good internal reliability and external validity (Endler & Parker, 1993; Endler & Parker, 1999). In the current sample, internal consistency for the three coping subscales, as measured by Cronbach's alpha coefficient ( $\alpha$ ) ranged from .85 to .87 (Task-Oriented coping = .87; Emotion-Oriented coping = .87; Avoidance-Oriented coping = .85).

#### 1.2.2. Post-traumatic diagnostic scale (PDS)

The PDS assesses self-reported PTSD symptomatology and allows for a provisional diagnosis of PTSD (Foa et al., 1997). Seventeen of the 49 questions map directly onto DSM-IV criteria for PTSD (American Psychiatric Association, 2000) and were the primary focus of the present work. The frequency of each symptom is rated on a 4-point scale (0 = not at all or only one time, 1 = once a week or less/once in awhile, 2 = 2–4 times a week/half of the time, 3 = 5 or more times a week/almost always). In typical practice, symptom severity scores are obtained by summing the 17 symptom items, with higher scores indicating greater symptomatology. The PDS has shown good reliability and validity (Foa et al., 1997; Sheeran & Zimmerman, 2002).

The PDS includes a twelve question checklist assessing past trauma experiences, a section focused on the most distressing experience, four questions assessing Criterion A, and nine questions assessing the level of impairment caused by the symptoms. A conservative approach was used to assess prior trauma exposure. Specifically, if a participant reported having experienced a prior traumatic event at Month 1 but did not report the same event at Month 3 the event was not counted.

In the present work, the PDS was modified to reflect symptom severity associated specifically with the WTC attack (see Baschnagel et al., 2005). Thus, the section assessing the most distressing trauma was dropped. Because none of our participants directly witnessed the 9/11 attacks, two questions about personal injury and personal threat were replaced with two questions assessing threat to others (“Was anyone you know personally physically injured or killed?” and “Did you think that the life of someone you personally know was in danger?”). The 17 symptom items, as well as the impairment items, were modified to reflect symptomatology related specifically to the WTC attack; the words, “about the traumatic event” were replaced with “about the World Trade Center attack” in each question. Additionally instructions on the PDS explicitly instructed participants to answer the questions with respect to their thoughts and feelings around the WTC attack. At Month 1, participants were asked to rate their level of symptomatology since the time of the WTC attack. At Month 3, participants were asked to rate their level of symptomatology within the past two weeks.

Based on prior work by Baschnagel et al. (2005) assessing the factor structure of PTSD using the PDS in a larger sample, from which this sample is derived, the symptom data in this study was compared using a 4-factor model approach (see rationale below). In the current sample, internal consistency for the Intrusions, Avoidance, Dysphoria and Hyperarousal subscales of the PDS, as measured by Cronbach's coefficient, ranged from .60 to .86 (at 1 month: Intrusions:  $\alpha = .76$ ; Avoidance:  $\alpha = .65$ ; Dysphoria:  $\alpha = .83$ ; Hyperarousal:  $\alpha = .81$ ; at 3 months: Intrusions:  $\alpha = .80$ ; Avoidance:  $\alpha = .60$ ; Dysphoria:  $\alpha = .86$ ; Hyperarousal:  $\alpha = .76$ ).

### 1.3. Analytic approach

The relationship between pre-9/11 coping and post-9/11 PTSD was assessed first with total PTSD symptom scores, then with total scores for each PTSD symptom factor at each month. To test total symptom scores, hierarchical multiple regression models were tested predicting overall PDS scores at Month 1 and Month 3 by sex (male coded 0, female coded 1) and level of previous trauma at step 1, and the three coping factors and their interaction with sex at step two. Variables making up the interaction terms were mean-centered (Aiken & West, 1991). Significant interactions were followed by simple effects analyses. In addition to total scores, separate regression models predicting each symptom factor score from sex, previous trauma, and individual coping styles were tested at each time point as well. Due to significant sex differences in raw scores (see Table 1) on emotion-focused and avoidance-focused coping, standardized T-scores, with a mean of 50 and a

standard deviation of 10 (Endler & Parker, 1999), were calculated separately for males and females for each coping factor.

Over the last decade, the three factor model of post-trauma symptoms defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM) has been questioned (e.g., King, Leskin, King, & Weather, 1998; Simms, Watson, & Doebbeling, 2002). Specifically, studies of the factor structure of post-trauma symptoms suggest that a four factor model better fits post-trauma symptoms than the DSM three factor model (e.g., Asmundson et al., 2000; Simms et al., 2002; Suvak, Maguen, Litz, Cohen Silver, & Holman, 2008). Based on the factor analytic work conducted by Baschnagel et al. (2005) in a larger sample from which the current sample is drawn, four additional regression models, similar to the models mentioned above, were conducted for each month predicting scores for each symptom factor (i.e., Intrusions, Avoidance, Dysphoria, and Hyperarousal; see Baschnagel et al. for details). All analyses were conducted with SPSS Software v15 (SPSS Inc.).

## 2. Results

### 2.1. Provisional diagnoses of PTSD

The sample was not a clinical sample but data on provisional diagnoses are included here. At one month post 9/11, 49% of the sample indicated that they thought the life of someone they knew personally was in danger during the 9/11 terrorist attack, 10% stated that they knew someone who was physically injured or killed during the attack (Criterion A1, confronted with an event which involved actual or threatened death or serious injury to others), and 38% endorsed Criterion A2 for PTSD (experiencing marked fear, hopelessness, or horror upon exposure). Using the cutoff score of 1 (once a week or less/once in awhile) or higher for each symptom on the PDS (Foa et al., 1997), 13% of the sample at Month 1 and 5% at Month 3 met provisional diagnoses of PTSD.

### 2.2. Group characteristics

In order to examine sex differences in dispositional coping, and number of prior traumatic events at Months 1 and 3, a series of independent *t*-tests were used (see Table 1). Females reported using significantly more pre-9/11 emotion-focused and avoidance-focused coping than males. However, no differences were noted between males and females on problem-focused coping prior to the attacks. No sex differences were noted on the number of prior traumatic events.

### 2.3. Regression analyses

#### 2.3.1. Overall symptom scores

Regression results for models predicting PTSD total score are presented in Table 2. At Month 1, sex and the number of previous traumas significantly predicted total PTSD symptomatology. Being female and having experienced a greater number of previous traumas were related to increased PTSD symptomatology at Month

**Table 1**

Means and standard deviation for pre-9/11 emotion-focused, avoidance-focused and problem-focused coping, prior trauma history and PDS total scores by sex.

	Males ( <i>n</i> = 146)	Females ( <i>n</i> = 159)	<i>t</i> -test ( <i>df</i> = 303)	<i>P</i>
CISS—pre trauma				
Emotion-focused coping	43.88 (9.43)	48.21 (10.27)	−2.88	.004
Avoidance-focused coping	49.34 (9.70)	52.69 (10.56)	−3.83	.001
Problem-focused coping	55.11 (8.64)	55.48 (8.39)	−.38	.70
Prior trauma history (# of trauma events)	1.04 (1.17)	1.03 (1.26)	.07	.95
PDS Total Score Month 1	5.30 (5.71)	9.46 (8.02)	−5.17	.001
PDS Total Score Month 3	3.72 (4.93)	4.98 (6.54)	−1.89	.060

Note. CISS = Coping Inventory for Stressful Situations

**Table 2**  
Model summaries for regression models predicting total PDS symptom scores from sex, previous trauma, problem-focused, emotion-focused, avoidance-focused coping styles and the interaction between sex and coping style at Month 1 and Month 3.

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	B	β	t	P	sr <sub>i</sub> <sup>2</sup>
Month 1	.42	.17	.15	7.7				<.001*	
Step 1									
Sex					4.2	.29	5.2	<.001*	.29
Previous Trauma					.70	.12	2.1	.04*	.12
Step 2									
Problem-focused coping					.63	.08	1.0	.30	.06
Emotion-focused coping					1.2	.16	2.0	.05*	.11
Avoidance-focused coping					-.25	-.03	-.40	.69	-.02
Sex × Problem-focused coping					.28	.03	.34	.74	.02
Sex × Emotion-focused coping					1.6	.15	1.9	.06	.10
Sex × Avoidance-focused coping					-.30	-.03	-.36	.72	-.02
Month 3	.31	.10	.07	3.9				<.001*	
Step 1									
Sex					1.3	.11	1.9	.06	.11
Previous Trauma					.77	.16	2.8	.01*	.16
Step 2									
Problem-focused coping					-.12	-.02	-.24	.81	-.01
Emotion-focused coping					1.3	.23	2.7	.01*	.15
Avoidance-focused coping					-.15	-.03	-.28	.78	-.02
Sex × Problem-focused coping					.67	.08	.95	.34	.05
Sex × Emotion-focused coping					.20	.02	.29	.78	.02
Sex × Avoidance-focused coping					-.54	-.07	-.77	.44	-.04

Note: *df* for all models = (1,296); PDS = Post-traumatic Diagnostic Scale. Alpha level = .05, significant results indicated by\*.

1. Greater emotion-focused coping was significantly predictive of greater levels of symptomatology as well. At Month 3, being female was marginally related to overall symptomatology. Increased previous trauma experience remained a significant predictor of increased PTSD symptomatology as did higher levels of emotion-focused coping.

2.3.2. Symptom factor scores

Results of models predicting each symptom factor score from sex, previous trauma, and individual coping styles are presented in Table 3. At Month 1 females exhibited greater scores for all four factors compared to males. Number of previous traumas positively predicted Intrusions and Dysphoria only. Of the three coping factors, only emotion-focused coping had a significant relationship with symptom factor levels. Greater levels of emotion-focused coping were associated with greater Dysphoria symptomatology. Emotion-focused coping style interacted with sex to predict Intrusions and Hyperarousal symptomatology, with simple effects analysis indicating that greater endorsement of emotion-focused coping significantly predicted greater levels of Intrusion ( $t = 4.6, P < .001$ , means:  $-1$  S.D. = 2.9,  $+1$  S.D. = 4.6) and Hyperarousal symptomatology for females ( $t = 4.4, P < .001$ , means:  $-1$  S.D. = 0.7,  $+1$  S.D. = 1.6) but not for males, Intrusion ( $t = 1.2$ , ns, means:  $-1$  S.D. = 2.1,  $+1$  S.D. = 2.5) and Hyperarousal ( $t = -.23$ , ns, means:  $-1$  S.D. = 0.4,  $+1$  S.D. = 0.4).

At Month 3, females exhibited greater Intrusions and Hyperarousal compared to males; number of previous traumas positively predicted increased symptoms of Avoidance, Dysphoria, and Hyperarousal, but not Intrusions. At Month 3 emotion-focused coping was the only coping style that significantly predicted individual symptom factor scores, predicting Dysphoria symptomatology, with greater endorsement of emotion-focused coping style predictive of greater Dysphoria symptoms.

3. Discussion

This study prospectively assessed the relationship between emotion-, avoidance-, and problem-focused coping style and self-reported post-traumatic stress symptomatology in a large group of

undergraduates who were indirectly exposed to the 9/11 WTC attacks. At both time points, higher levels of pre-9/11 emotion-focused coping predicted greater levels of overall PTSD symptomatology. For the individual PTSD factor scores, emotion-focused coping was again the only coping style that predicted symptom scores. Greater emotion-focused coping predicted increased Dysphoria at both time points. At Month 1 but not Month 3, higher emotion-focused coping also predicted greater Hyperarousal, but this effect was limited to women.

Based upon the extant literature, the relationship between PTSD symptomatology and emotion-focused coping was expected (e.g., Gil, 2005; Hyer et al., 1996; Valentiner et al., 1996). It seems intuitive that increased use of emotion-focused coping behaviors like self-preoccupation, rumination, or worry might put one more at risk to develop PTSD symptomatology (Kleim, Ehlers, & Glucksman, 2007). For example, rumination and worry are characteristic of depression and anxiety disorders (e.g., Ehlers & Clark, 2000; Nolen-Hoeksema, 2000) and may represent risk factors for developing or maintaining the general negative affect associated with these disorders. In fact, rumination has been shown to be a predictive factor of chronic PTSD (Ehlers, Mayou, & Bryant, 1998; Kleim et al., 2007; Murray, Ehlers, & Mayou, 2002). In relation to individual symptom factors, emotion-focused coping was associated with increases in Dysphoria and, in females, Hyperarousal at Month 1. At Month 3 however, only the relationship between emotion-focused coping and Dysphoria symptoms remained, suggesting that emotion-focused coping strategies may maintain the negative affect associated with indirect trauma exposure. Alternatively, given that the present analyses are correlational in nature, it may be that pre-trauma depression increases both pre-trauma emotion-focused coping style and post-trauma PTSD symptoms, thus creating the apparent link between emotion-focused coping and trauma-related Dysphoria symptomatology.

Contrary to our hypotheses avoidance-focused coping did not predict level of PTSD symptomatology at either Month 1 or Month 3 as was predicted based on previous literature (e.g., Bryant & Harvey, 1995; Gil, 2005) and suggested by cognitive-behavioral

**Table 3**

Model summaries for regression models predicting PDS symptom scores for each factor from sex, previous trauma, problem-focused, emotion-focused, avoidance-focused coping styles and the interaction between sex and coping style at Month 1 and Month 3.

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	B	β	t	P	sr <sub>i</sub> <sup>2</sup>
<b>Month 1</b>									
<b>Intrusion</b>	.43	.18	.16	8.2				<.001*	
Step 1									
Sex					1.5	.28	5.2	<.001*	.28
Previous Trauma					.24	.12	2.1	.04*	.12
Step 2									
Problem-focused coping					.15	.06	.72	.47	.04
Emotion-focused coping					.26	.10	1.3	.21	.07
Avoidance-focused coping					.01	.00	.03	.97	.00
Sex × Problem-focused coping					.35	.09	1.2	.24	.06
Sex × Emotion-focused coping					.79	.22	2.7	.01*	.14
Sex × Avoidance-focused coping					-.20	-.06	-.69	.49	-.04
<b>Avoidance</b>	.28	.08	.05	3.0				.003*	
Step 1									
Sex					.55	.20	3.5	<.001*	.20
Previous Trauma					.05	.04	.75	.45	.04
Step 2									
Problem-focused coping					.07	.05	.54	.59	.03
Emotion-focused coping					.12	.09	1.1	.29	.06
Avoidance-focused coping					.12	.09	.98	.33	.06
Sex × Problem-focused coping					.05	.03	.31	.76	.02
Sex × Emotion-focused coping					.18	.09	1.1	.27	.06
Sex × Avoidance-focused coping					-.18	-.09	-1.1	.28	-.06
<b>Dysphoria</b>	.34	.11	.09	4.7**				<.001*	
Step 1									
Sex					1.4	.19	3.5	.001*	.19
Previous Trauma					.37	.13	2.3	.02*	.13
Step 2									
Problem-focused coping					.29	.08	.96	.34	.05
Emotion-focused coping					.79	.22	2.7	.01*	.15
Avoidance-focused coping					-.37	-.10	-1.2	.23	-.07
Sex × Problem-focused coping					.04	.01	.10	.92	.01
Sex × Emotion-focused coping					.19	.04	.46	.65	.03
Sex × Avoidance-focused coping					.01	.00	.03	.98	.00
<b>Hyperarousal</b>	.39	.15	.13	6.6				<.001*	
Step 1									
Sex					.78	.30	5.5	<.001*	.30
Previous Trauma					.04	.03	.60	.55	.03
Step 2								.28	
Problem-focused coping					.12	.09	1.1	.28	.06
Emotion-focused coping					-.01	-.01	-.06	.95	.00
Avoidance-focused coping					.00	.00	-.03	.97	.00
Sex × Problem-focused coping					-.16	-.08	-1.0	.30	-.06
Sex × Emotion-focused coping					.42	.23	2.8*	.01*	.15
Sex × Avoidance-focused coping					.07	.04	.49	.63	.03
<b>Month 3</b>									
<b>Intrusion</b>	.22	.05	.02	1.8				.07	
Step 1									
Sex					.49	.13	2.2	.03*	.13
Previous Trauma					.16	.10	1.8	.08	.10
Step 2									
Problem-focused coping					-.08	-.04	-.44	.66	-.03
Emotion-focused coping					.10	.05	.61	.55	.04
Avoidance-focused coping					.11	.06	.63	.53	.04
Sex × Problem-focused coping					.31	.11	1.3	.18	.08
Sex × Emotion-focused coping					.16	.06	.48	.48	.04
Sex × Avoidance-focused coping					-.37	-.14	-1.6	.12	-.09
<b>Avoidance</b>	.27	.07	.05	2.9				.01*	
Step 1									
Sex					.09	.05	.91	.37	.05
Previous Trauma					.09	.12	2.2*	.03*	.12

Table 3 (Continued)

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	B	β	t	P	sr <sub>i</sub> <sup>2</sup>
Step 2									
Problem-focused coping					.07	.07	.86	.39	.05
Emotion-focused coping					.12	.14	1.6	.11	.09
Avoidance-focused coping					.00	.00	.01	.99	.00
Sex × Problem-focused coping					.02	.02	.19	.85	.01
Sex × Emotion-focused coping					.11	.09	1.0	.31	.06
Sex × Avoidance-focused coping					-.18	-.15	-1.7	.08	-.10
<b>Dysphoria</b>	.30	.09	.07	3.7				<.001*	
Step 1									
Sex					.33	.05	.88	.38	.05
Previous Trauma					.38	.14	2.5	.02*	.14
Step 2									
Problem-focused coping					-.14	-.04	-.48	.63	-.03
Emotion-focused coping					.99	.30	3.6	<.001*	.20
Avoidance-focused coping					-.18	-.05	-.60	.55	-.03
Sex × Problem-focused coping					.20	.04	.50	.62	.03
Sex × Emotion-focused coping					-.24	-.05	-.62	.54	.03
Sex × Avoidance-focused coping					-.03	-.01	-.07	.95	.00
<b>Hyperarousal</b>	.32	.10	.08	4.1				<.001*	
Step 1									
Sex					.37	.17	3.0	.003*	.17
Previous Trauma					.15	.17	3.0	.003*	.17
Step 2									
Problem-focused coping					.02	.02	.25	.80	.01
Emotion-focused coping					.13	.11	1.4	.17	.08
Avoidance-focused coping					-.08	-.07	-.84	.40	-.05
Sex × Problem-focused coping					.14	.09	1.0	.30	.06
Sex × Emotion-focused coping					.17	.11	1.3	.19	.07
Sex × Avoidance-focused coping					.04	.02	.27	.79	.02

Note: *df* for all models = (1,296); PDS = Post-traumatic Diagnostic Scale. Alpha level = .05, significant results indicated by\*.

models of PTSD (Foa & Kozak, 1986; Horowitz, 1986). It is possible that avoidance-focused coping may have had less of an impact on symptomatology given that the main avenue of exposure was through repeated media reports. In this type of exposure situation, it may be that little avoidance behavior is utilized or that avoidance by distraction or talking with others may reduce the exposure to repeated viewing of the terrorist attack which may reduce the likelihood of being negatively impacted by media exposure. Alternatively, it could be that avoidance-focused coping is detrimental only after symptoms have developed. Most studies that have assessed the relationship between coping styles and trauma symptoms have used retrospective designs. It may be that avoidance-focused coping is not related to the development or onset of PTSD symptomatology but rather may interfere with recovery from PTSD once symptoms have developed. These hypotheses present interesting questions for our understanding of the role that avoidance-focused coping plays in PTSD.

Problem-focused coping was not related to post-trauma symptomatology in this sample. This may not be surprising considering that problem-focused coping involves, for example, “taking action,” “adjust priorities,” “come up with several different solutions to a problem,” or “get organized to stay on top of the situation” (Endler & Parker, 1999). As such, it is possible that problem-focus coping strategies may simply not be relevant to cope with repeated indirect exposure to terrorist attack via television. Further examination is clearly needed to understand the role of problem-focused coping in initiation and maintenance of PTSD symptoms.

The null findings for avoidance- and problem-focused coping are interesting given that popular cognitive-behavioral theories of PTSD (Foa & Kozak, 1986; Horowitz, 1986) might suggest that avoidance behavior would be associated with greater PTSD symptoms and active problem solving behavior would be associated with lower levels of symptomatology. A question that

arises from the coping literature that may be of consideration is the extent to which individuals depend on a dispositional coping style or choose a coping behavior that is situation-specific when confronted with a stressful situation (Carver et al., 1989). The current study assessed coping as a trait variable and found that emotion-focused coping was associated with greater symptomatology, which suggests that dispositional coping dimensions may be important considerations when trying to understand the development and maintenance of PTSD symptoms. However, it may be that participants depended on a coping strategy in this specific situation (9/11) that was discordant from their reported dispositional coping style. Lazarus and Folkman (1984) suggest that a stress response consists of a primary appraisal (initially perceiving a threat) and a secondary appraisal (thinking of potential responses to a threat), and that coping is the active application of possible responses. It may be that the indirect nature of the traumatic event created a situation where activation of avoidance- and problem-focused coping was not necessary but for those who report using high levels of emotion-focused coping, the emotional nature of the 9/11 events may have activated this coping mechanism. Continued prospective studies are needed to clarify the role of dispositional coping styles and situation-specific coping behavior and their relationship to PTSD.

As found in previous studies, sex and previous trauma history were associated with PTSD symptomatology. Being female and having an increased number of previous trauma experiences were both significant predictors of increased total PTSD symptomatology at Months 1 and 3. When assessing symptom factors, being female was associated with greater symptom levels on all four factors at Month 1 and for Intrusions and Hyperarousal at Month 3. Greater level of prior trauma experience was significantly predictive of Intrusion and Dysphoria symptoms at Month 1 and Avoidance, Dysphoria, and Hyperarousal at Month 3.

The current findings with participants experiencing indirect exposure suggest that coping strategies among individuals exposed to a traumatic event (indirectly and perhaps directly) should potentially be a target for clinical intervention. Particularly, individuals who depend more on emotion-focused coping may benefit from intervention that helps them to orient to other approaches, such as addressing immediate needs (e.g., connecting with loved ones, finding food and shelter, etc.). In light of traumatic events like 9/11, the clinical community has shown much interest in providing preventive therapy. However, preventive counseling may actually be more detrimental than helpful and its efficacy for treating all trauma survivors has been questioned (see McNally, Bryant, & Ehlers, 2003 for a review). Additionally, given that not everyone who experiences a traumatic event will develop PTSD (Ehlers et al., 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) providing preventative treatment may not be cost efficient. Thus knowing predisposing factors, such as coping style, may help clinicians focus preventative efforts more efficiently in the aftermath of a traumatic event, treating only those who are at greater risk for PTSD.

The current study does have limitations. First, the current sample was not directly exposed to the traumatic event and clinical interviews were not conducted to confirm clinical diagnoses. There is controversy in the field as to what characterizes a Criterion A event for PTSD diagnosis with some arguing that the interpretation of this criterion may be overly lax (McNally, 2003). Additionally, rates of previous trauma exposure may be underestimated due to the fact that the PDS is not the most sensitive measure of trauma exposure. Thus the current sample is not a clinical sample, which limits the generalizability of the findings to the role of coping in development of post-traumatic stress symptoms as opposed to post-traumatic stress disorder per se. Despite this limitation, 38% of the sample did meet a moderate interpretation of DSM-IV criterion A for PTSD and a little more than 12% met a provisional diagnosis of PTSD at Month 1 and 5% at Month 3 according to Foa et al.'s (1997) cutoffs for the Post-traumatic Diagnostic Scale. These rates are comparable to other studies assessing indirect exposure which have found between 4 and 11% of participants who have experienced significant post-traumatic stress symptoms or probable PTSD at 2 months post 9/11 (Galea et al., 2003; Schlenger et al., 2002; Silver et al., 2002). Additionally, given the difficulty of designing prospective studies, studying indirect exposure to traumatic events is important, albeit not ideal, when trying to understand the role of pre-trauma coping styles in the development of PTSD.

Another limitation is the lack of pre-9/11 PTSD symptom data and other relevant data (e.g., depression symptomatology). Without this data, the ability to ascertain the role of coping strategies in the actual development of post-traumatic stress symptoms is limited. Thus we do not know if post-traumatic stress symptomatology at Month 1 was fully caused by reactions to 9/11 or to what extent they were preexisting. However, questionnaire items were specifically worded to reflect experiences directly related to 9/11, reducing the likelihood that the level of symptomatology was due to preexisting traumatic experiences.

Despite these limitations, this study is unique in that its prospective design provides an opportunity to begin assessing the relationship between pre-trauma coping style and the level of trauma symptomatology after exposure to a traumatic event. This is an important issue in the trauma literature that understandably lacks data due to the difficulty of conducting prospective studies of PTSD development. The current findings highlight a need for further examination of the role of different coping strategies in initial trauma reactivity and recovery as well as long term adjustment following a traumatic event.

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