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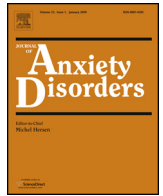
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Sex differences in coping strategies in military survival school



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ABSTRACT

A wealth of research has examined psychological responses to trauma among male military service members, but few studies have examined sex differences in response to trauma, such as coping strategies. This study assessed coping strategies used by male and female U.S. service members completing an intensely stressful mock-captivity exercise, compared strategies by sex, and assessed the relationship between coping and posttraumatic stress symptoms (PTSS). Two hundred service members (78% male) completed self-report surveys before and after mock captivity. Surveys assessed demographics, service characteristics, PTSS, and coping strategies used during mock captivity. Participants used seven coping strategies: denial, self-blame, religion, self-distraction, behavioral disengagement, positive reframing, and planning. Women used denial ($p \leq .05$), self-blame ($p \leq .05$), and positive reinterpretation ($p \leq .05$) strategies more frequently than men, and they had higher PTSS levels following the exercise. Structural equation modeling showed that the relationship between sex and PTSS was fully mediated by coping strategies. The results of this study suggest that reducing the use of maladaptive coping strategies may mitigate PTSS among females. Future efforts should target improving coping during highly stressful and traumatic experiences.

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1. Introduction

One of the most prevalent health issues experienced by active-duty service members is posttraumatic stress disorder (PTSD), which is estimated to affect one sixth of veterans of Operations Iraqi and Enduring Freedom (Cohen, Gima, Bertenthal, Kim, & Marmar 2010; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Seal et al., 2009). The consequences of PTSD are severe; veterans with PTSD are at an increased risk for numerous adverse outcomes, including poor physical health, substance abuse, and attrition (Hoge et al., 2007; Jakupcak, Tull, McDermott, Kaysen, Hunt, & Simpson, 2010; Schmied, Highfill-McRoy, & Larson, 2012). To reduce the risk of

PTSD among service members, for whom exposure to trauma is often a requisite of service, it is critical to understand the causal pathways through which the disorder develops.

An important consideration in the study of PTSD is the difference in prevalence rates between men and women. Research in civilian populations has consistently shown higher rates of PTSD in women, with some studies reporting a twofold higher risk compared with men (Breslau, 2009; Kesler, Sonnega, Bromet, Hughes, & Nelson, 1995; Olff, Langeland, Draijer, & Gersons, 2007). Results from research involving military populations have been less consistent. For example, while two large studies found higher rates of PTSD among women, several others found higher rates among men, or found no sex differences (Haskell et al., 2010; Maguen, Bosch, Marmar, & Seal, 2010; Ramchand et al., 2010; Rona, Fear, Hull, & Wessely, 2006; Schell & Marshall, 2008; Smith et al., 2008). It should be noted that sex differences in rates and types of combat exposure due to historical restrictions on females serving in combat roles complicate sex comparisons of PTSD levels. Nevertheless, the inconsistent findings indicate a need to further elucidate the relationship between sex and PTSD.

Differences in the coping strategies used by men and women during and after highly stressful or traumatic situations may explain the disparate rates of PTSD across sexes. There is evidence

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that certain coping strategies are associated with increased risk of psychiatric symptoms following trauma; these maladaptive strategies are broadly classified as emotion- and avoidance-based strategies, and include self-blame, denial, and rumination (Lazarus & Folkman, 1984; Pacella et al., 2011; Pineles et al., 2011; Schnider, Elhai, & Gray, 2007; Tamres, Janicki, & Helgeson, 2002). Many studies and reviews have concluded that women use these maladaptive techniques more frequently than men do (Matud, 2004; Nolen-Hoeksma, 2001, 2012; Nolen-Hoeksma & Aldao, 2011; Tamres et al., 2002). For instance, in a study of 2816 civilians, female participants reported using emotion- and avoidance-based coping styles significantly more frequently than male participants did (Matud, 2004). However, no study has compared coping strategies used by male and female service members during military-specific events or exercises.

Methodological issues further limit the conclusions that can be drawn regarding sex differences in coping and PTSD. For example, with the exception of studies of victims of natural disasters or terror attacks, most coping studies have typically pooled individuals who may have experienced similar types of trauma, but under unique circumstances (i.e., child abuse, motor vehicle accidents; Araya, Chotai, Komproe, & de Jong, 2007; Carstenson et al., 2012; Pacella et al., 2011; Ullman & Filipas, 2005). The variability in traumatic experiences and surrounding circumstances make it difficult to generate accurate comparisons because it is unclear whether sex differences in coping are simply due to differences in the nature of the traumatic event. Ruling out this explanation requires controlling for or standardizing the trauma experienced by men and women. Moreover, most studies have been cross-sectional and/or have relied on retrospective self-reports of the coping strategies used during and after traumas that may have occurred several years earlier (Breslau, 2009).

An additional limitation of previous research regarding sex differences in coping and PTSD is a lack of consideration of prior traumatic events and preexisting PTSD. Research suggests prior traumatic exposure may influence how individuals respond to and cope with future trauma; specifically, individuals with a prior history of trauma may have more negative reactions to future trauma (Breslau, Chilcoat, Kessler, & Davis, 1999; Breslau, Peterson, & Schultz, 2008; Brewin, Andrews, & Valentine, 2000; Ehlers & Clark, 2000; Johnsen, Eid, Laberg, & Thayer, 2002; Olff et al., 2007). Additionally, individuals with prior traumatic exposure may already be experiencing psychological distress, including posttraumatic stress symptoms (PTSS), because of that experience (Breslau, 2009). Therefore, it is critical to include measures of both prior trauma and preexisting PTSS when examining the relationship between how individuals cope with a highly stressful event and their future distress.

Research conducted in standardized conditions is needed to clarify the relationships between sex, coping, and PTSD. To address this and other limitations of previous research, we examined the relationships between prior traumas, coping, and PTSS in 200 male and female service members completing an intensely stressful standardized military training activity. The primary objective of this study was to compare the coping strategies used by male and female service members during the training activity. Based on previous research, we hypothesized that notable differences in coping strategies across sexes would be observed (Matud, 2004; Nolen-Hoeksma, 2001, 2012; Nolen-Hoeksma & Aldao, 2011; Tamres et al., 2002). Specifically, we expected that women would report both more PTSS and greater use of avoidant coping strategies. In addition, we hypothesized that sex differences in PTSS would be partially explained by sex differences in coping. This hypothesis was tested using a path model (see Fig. 1). As Fig. 1 shows, we examined the mediational role of coping in the relationship between sex and PTSS, while also accounting for prior

traumatic exposure, preexisting PTSS, and demographic characteristics.

2. Methods

2.1. Study setting

Data for this study were collected during the Survival, Evasion, Resistance, and Escape (SERE) training conducted at the Center for Security Forces SERE Learning Site West, located in San Diego, California. SERE training, which includes a period of realistic mock captivity, is required by the US military for all service members in positions characterized as high risk of capture. SERE is a 12-day course, which is composed of a 5-day period of classroom-based didactic training and a 7-day period of field training, during which students learn survival, evasion, resistance, and escape techniques. During the field training, students are “captured” by a simulated enemy in order to practice utilizing resistance techniques in response to mock exploitation. A more comprehensive description of SERE has been published elsewhere (Dimoulas et al., 2007; Morgan et al., 2004; Morgan et al., 2000; Taylor et al., 2012), although many aspects of the training curriculum are classified.

2.2. Study design and procedures

This prospective study utilized survey data collected as part of a larger study that took place between October 2011 and August 2012. Participants were recruited on the first day of SERE training via a staff-administered oral brief providing a study overview to all SERE students. Following the brief, interested students attended an in-person meeting to review study details and complete the written consent form. Due to staff and equipment limitations, study enrollment was limited to approximately 25% of all SERE students; therefore, participants were enrolled on a first-come, first-serve basis. Females were oversampled to achieve a sample size sufficient for sex comparisons. Data for the current study were collected at two time points: at consent prior to the start of the training (baseline), and within 24 h after completing SERE training (follow-up). At baseline, participants completed a written questionnaire assessing demographics, medical history, and measures of PTSS and prior traumatic experiences. Participants also completed a shortened version of the baseline survey at follow-up, which included measures of coping and PTSS.

2.3. Participants

Because a primary aim of the larger study from which the present data were drawn was to quantify biological response to acute stress, participants were excluded from the present study based on the following criteria: (1) self-reported use of anabolic or ergogenic substance, drug, or supplement within the past 3 months, (2) current antihypertensive medication use, or (3) current type 1 or type 2 diabetes diagnoses requiring medication. The final sample included 200 service members (78% male).

2.4. Measures

2.4.1. Posttraumatic stress symptoms

PTSS was assessed with the 22-item Impact of Events Scale-Revised version (IES-R; Weiss & Marmar, 1997). Participants completed the IES-R at baseline and follow-up. The IES-R includes three subscales corresponding to PTSD symptom clusters (i.e., intrusion, hyperarousal, avoidance; DSM-IV, American Psychiatric Association, 2000). At baseline, participants were asked to report how much they felt bothered or distressed within the past 7 days by “the most impactful event you have previously experienced.” At

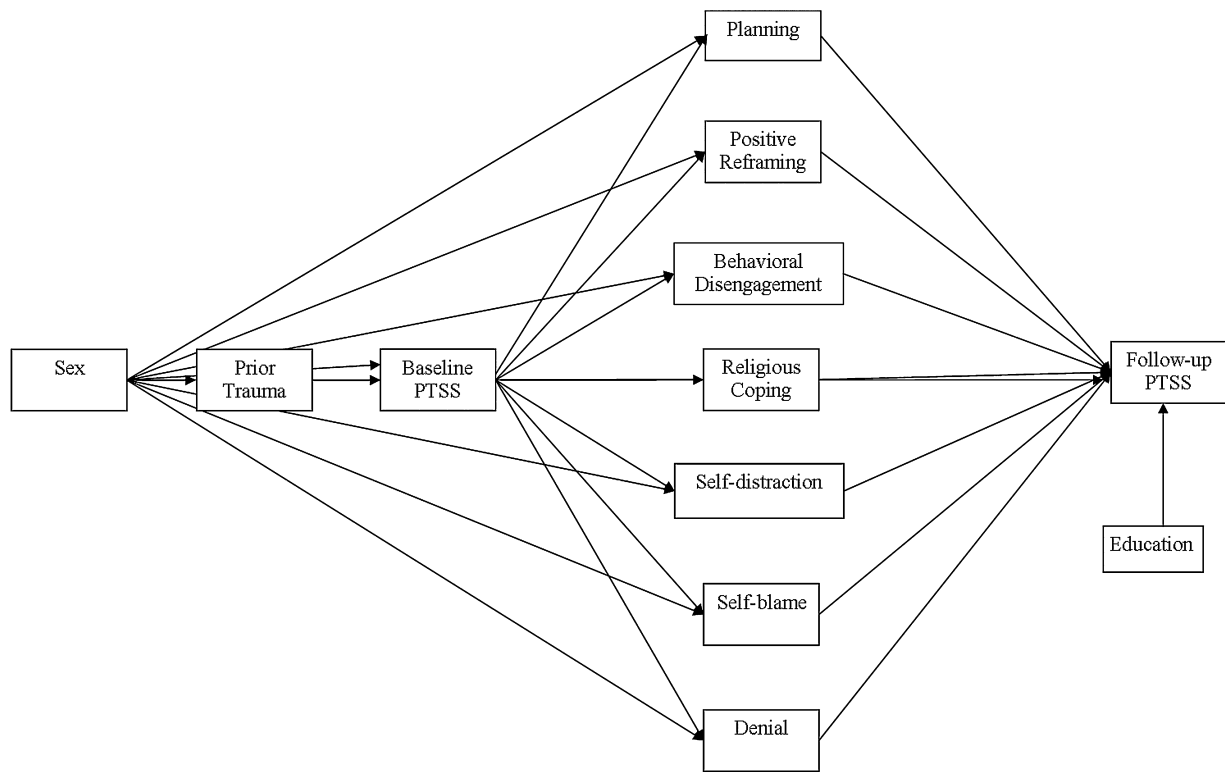


Fig. 1. Proposed path model for the interrelationships between sex, pre-SERE trauma and psychological distress, coping strategies, and post-SERE psychological distress. PTSS, post-traumatic stress symptoms; SERE, Survival, Evasion, Resistance, and Escape training.

follow-up, they reported how much they felt bothered or distressed by the mock-captivity challenge. Sample IES-R items include, “I thought about it when I didn’t mean to,” “I felt watchful or on-guard,” and “I felt as if it hadn’t happened or wasn’t real.” Response options ranged from 0 (*not at all*) to 4 (*extremely*). A total score was computed as the mean of the individual item ratings, with higher scores indicating higher symptom levels ($\alpha = .89$).

2.4.2. Coping

We measured coping using the Coping Strategies in SERE (CSSERE) scale, a modified version of the Brief COPE (Carver, 1997) designed specifically for this study. The original 28-item Brief COPE assesses 14 unique coping strategies used in response to stress, such as “I tried to come up with a strategy about what to do” and “I refused to believe it was happening.” The Brief COPE was modified for use in the current study by removing items irrelevant to the SERE setting (e.g., “I’ve been turning to work to take my mind off things”), and developing new items (e.g., “I drew strength from anger”). The CSSERE has 22 items, including 17 from the Brief COPE and 5 new items. Response options ranged from 1 (*I did not do this at all*) to 4 (*I did this a lot*).

Although the original Brief COPE was designed to include 14 sub-scales, it has been noted that the factor structure may vary across samples (Carver, 1997; Greening & Stoppelbein, 2007). Therefore, the underlying structure of the CSSERE was assessed via exploratory factor analysis prior to conducting hypothesis testing. Exploratory factor analysis identified seven factors with eigenvalues >1.0 that collectively accounted for 61.0% of the total variance. Because reliance on eigenvalues can lead to an overestimation of factors, Horn’s parallel analysis was also conducted (O’Connor, 2000). Results of the parallel analysis supported the 7-factor structure of the CSSERE. The seven factors corresponded to seven factors of the original Brief COPE: planning (5 items; $\alpha = .68$), self-distraction (3 items; $\alpha = .65$), self-blame (2 items; $\alpha = .68$), religion

(2 items; $\alpha = .87$), positive reframing (2 items; $\alpha = .68$), behavioral disengagement (2 items; $\alpha = .58$), and denial (3 items; $\alpha = .49$). Examination of factor loadings revealed three items with cross-loadings of $>.3$, and these items were subsequently excluded from further analyses.

2.4.3. Prior trauma

We assessed prior trauma using the Brief Trauma Questionnaire (BTQ; Schnurr, Vieilhauer, Weathers, & Findler, 2009). The BTQ includes 10 yes/no questions assessing exposure to specific types of trauma, such as natural disasters, sexual or physical abuse, physical assault, or combat trauma. The total number of types of traumatic events endorsed was summed.

2.4.4. Participant characteristics

Characteristics assessed included age (years), sex, education (high school diploma or equivalent vs. more than high school), ethnicity (non-Hispanic white, Hispanic, Asian, African-American, other/multiple), and branch of military service (Navy vs. Marine Corps).

2.5. Analysis

Descriptive statistics were calculated for all study variables to assess means and standard deviations for continuous data, and frequencies and percentages for categorical data. Independent *t* tests and Pearson chi-square analyses were used for sex comparisons, and effect sizes for group differences were calculated using Cohen’s *d* statistic. Analysis of variance (ANOVA) was conducted to assess differences by sex in utilization of each coping strategy. These analyses were conducted using SPSS statistical software, version 19.0 (IBM, Armonk, NY), and the alpha for detecting statistical significance was set at $p < .05$.

Path analyses were conducted using maximum likelihood estimation in Analysis of Moment Structures (Amos, version 19.0; IBM SPSS). Covariance was permitted between exogenous variables (Chapman, Kertz, Zurlage, & Woodruff-Borden, 2008; Lang et al., 2008), which included sex and three covariates (age, education, and service branch), and viable paths were added based on modification indices, which is consistent with past research (Annesi & Marti, 2011; Levahot & Simoni, 2011). After examining the fit of the full hypothesized model with modification indices, we tested a reduced model that excluded non-significant paths. The best-fitting model was determined by comparing the fit of the full hypothesized and reduced models.

We examined model fit using chi-square goodness-of-fit tests and several model fit indices: comparative fit index (CFI), parsimony comparative fit index (PCFI), and root mean square error of approximation (RMSEA). Acceptable cutoffs are $\geq .95$ for CFI and $\leq .08$ for RMSEA (Schreiber, Stage, King, Nora, & Barlow, 2006). There is no agreement regarding an acceptable cutoff value for the PCFI (Mulaik et al., 1989; Schreiber et al., 2006), although higher scores indicate better fit.

2.5.1. Missing values

With the exception of the baseline IES-R, no more than 3% ($n = 6$) of values were missing for any study variable. However, due to a skip pattern embedded in the baseline survey, a number of participants ($n = 49$) were missing baseline IES-R scores. More specifically, participants were instructed to skip the IES-R on the baseline survey if they had never experienced at least one type of trauma included on the BTQ. To determine the most appropriate method for treating the missing values, comparison testing was performed for all baseline variables to assess differences between participants who did and did not complete all survey items. No group differences were found for any variables ($p > .05$), suggesting the data were missing at random. Given this information, all cases were included in the analyses using the full information maximum likelihood (FIML) default procedure in Amos. FIML has been shown to outperform other methods of treating missing data such as mean substitution, listwise and pairwise deletion, and certain imputation techniques (Enders & Bandalos, 2001).

3. Results

3.1. Participant characteristics

Table 1 includes descriptive statistics for all participants, stratified by sex. The mean participant age was 25.2 years (standard deviation [SD] = 4.4). Most participants (67.7%) were non-Hispanic white and had higher than a high school education (64.3%). A majority (72.1%) were in the Navy. Comparison tests showed only one significant difference across sexes in terms of demographic characteristics: more female participants had more than a high school education ($\chi^2 = 7.5, p < .01$).

At baseline, the average participant reported approximately two types of prior traumatic events, and very low levels of PTSS, as indicated by IES-R scores. Baseline IES-R scores did not significantly differ across sexes. At follow-up, the mean IES-R score increased, and was significantly higher for women than for men ($p < .05$; $d = .40$). The most frequently endorsed coping strategy across all participants was self-distraction ($M = 2.72, SD = 0.83$), followed by planning ($M = 2.63, SD = 0.65$), and positive reframing ($M = 2.38, SD = 0.90$).

A series of ANOVA models examined sex differences in coping strategies (data not shown). Women reported utilizing religion ($F(1, 192) = 5.54, p < .05, \eta_p^2 = 0.35$), self-blame ($F(1, 192) = 5.54, p < .05, \eta_p^2 = 0.03$), and denial ($F(1, 192) = 9.95, p < .05, \eta_p^2 = 0.049$)

Table 1

Demographic and service characteristics for 200 service members attending military survival training, stratified by sex.

	N (%) or M (SD)	
	Men (N = 156)	Women ^a (N = 44)
Age, in years (M [SD])	25.1 (4.7)	25.32 (3.11)
Education		
High school/GED	63 (40.6)	8 (18.2)**
>High school	92 (59.4)	36 (81.8)**
Ethnicity		
White	103 (66.9)	31 (70.5)
Hispanic/Latin	18 (11.7)	3 (6.8)
Asian	7 (4.5)	4 (9.1)
African-American	8 (5.2)	2 (4.5)
Other/multiple	18 (11.5)	4 (9.0)
Service		
Navy	106 (68.8)	36 (83.7)
Marine Corps	48 (31.2)	7 (16.3)
Prior traumatic events [M (SD); range: 0–10]	2.13 (1.8)	1.63 (1.6)
Baseline PTSS [IES-R; M (SD); range: 0–4]	0.29 (0.39)	0.47 (0.52)
Follow-up PTSS [IES-R; M (SD); range: 0–4]	0.81 (0.70)	1.08 (0.67)*
Coping strategy [M (SD); range: 1–4]		
Self-distraction	2.68 (0.84)	2.89 (0.76)
Planning	2.60 (0.65)	2.72 (0.64)
Positive reframing	2.32 (0.86)	2.62 (1.01)*
Religion	2.15 (1.08)	2.54 (1.11)*
Self-blame	1.59 (0.68)	1.88 (0.81)*
Denial	1.33 (0.47)	1.62 (0.69)**
Behavioral disengagement	1.19 (0.52)	1.15 (0.30)

IES-R, Impact of Events Scale-Revised; PTSS, post-traumatic stress symptoms.

^a Significance tests reflect comparisons between sexes.

* $p < .05$.

** $p < .01$.

significantly more frequently than men (Table 1). However, when controlling for education there was no longer a significant difference for religion ($F(1, 190) = 2.85, p > .05$); however, a significant difference emerged for positive reframing, with women reporting greater use ($F(1, 190) = 4.37, p < .05, \eta_p^2 = 0.02$). Self-blame ($F(1, 190) = 4.75, p < .05, \eta_p^2 = 0.02$) and denial ($F(1, 190) = 9.24, p < .05, \eta_p^2 = 0.05$) remained significantly higher among women in the adjusted models.

3.2. Item correlations

Table 2 shows the item correlations among study variables, stratified by sex (male participants above the diagonal, females below the diagonal). For men and women, the strongest correlations were between follow-up PTSS and both denial (men $r = .46, p < .001$; women $r = .47, p < .01$) and self-blame (men $r = .36, p < .001$; women $r = .54, p < .001$), and self-blame and denial were significantly inter-correlated in each group as well (men $r = .28, p < .001$; women $r = .44, p < .01$). Planning was the only coping strategy not significantly correlated with follow-up PTSS among men. Baseline PTSS was correlated with prior traumatic events among women ($r = .40, p < .05$), but not men.

3.3. Mediation model

The hypothesized mediational model, shown in Fig. 1, suggests that the relationship between sex and PTSS following SERE is mediated by prior trauma, baseline PTSS, and coping strategies. The full hypothesized model, which allowed the 7 coping strategies

Table 2Pearson correlations among model variables for male and female personnel.^a

	1	2	3	4	5	6	7	8	9	10
1. Follow-up PTSS	1.0	.31***	.10	.16*	.38***	.46***	.24**	.36***	.09	.07
2. Religion	-.12	1.0	.17*	.20*	.19*	.14	.30***	.05	.17	.11
3. Planning	-.14	.09	1.0	.22**	-.15	-.05	.31***	.18*	.23*	.18*
4. Positive reframing	-.03	.25	.14	1.0	-.01	.24**	.22**	.03	.13	-.01
5. Behavioral disengage	.30*	-.15	.02	.16	1.0	.33***	.00	.22**	-.02	-.03
6. Denial	.47**	-.01	-.07	.06	.17	1.0	.09	.28***	.01	-.11
7. Self-distraction	-.13	.02	.16	-.02	-.38*	.00	1.0	.05	.29***	.02
8. Self-blame	.54***	-.04	-.05	-.09	.37*	.44**	-.35*	1.0	.04	.08
9. Baseline PTSS	.47*	.27	.01	-.10	-.07	.22	-.02	.23	1.0	.16
10. Traumatic events	.16	.02	.06	.00	-.20	.18	.09	.12	.40*	1.0

Note. PTSS, post-traumatic stress symptoms.

^a Correlations shown above the diagonal represent male personnel and correlations below the diagonal represent female personnel.* $p < .05$.** $p < .01$.*** $p < .001$.

to correlate based on the modification indices⁶ (Annesi & Marti, 2011; Levahot & Simoni, 2011), showed good fit: $\chi^2(18) = 24.39$ ($p = .14$); CFI = 0.97; RMSEA = 0.04; PCFI = 0.22. Examination of the path coefficients showed 15 paths were non-significant ($p > .05$), including sex to positive reframing, planning, behavioral disengagement, religion, and self-distraction; baseline PTSS to all coping strategies except planning and self-distraction; and planning and positive reframing to follow-up PTSS (Fig. 1). All 15 non-significant paths were removed and model fit was re-examined for the reduced model. The reduced model also had very good fit, $\chi^2(33) = 37.94$ ($p = .25$); CFI = 0.98; RMSEA = 0.03; PCFI = 0.41. Considering the improvement in the fit indices, the reduced model was determined to be the best fitting and final model.

The final model with all significant path coefficients is shown in Fig. 2. Sex had direct effects on only a few variables: baseline PTSS ($\beta = .19$, $p < .05$), self-blame ($\beta = .18$, $p < .01$), and denial ($\beta = .21$, $p < .01$). Baseline PTSS predicted the use of self-distraction ($\beta = .19$, $p < .05$) and planning strategies ($\beta = .15$, $p < .05$), and it fully mediated the relationship between sex and planning. Self-distraction fully mediated the relationship between baseline and follow-up PTSS. Behavioral disengagement ($\beta = .20$, $p < .001$), self-distraction ($\beta = .14$, $p < .05$), religion ($\beta = .12$, $p < .05$), self-blame ($\beta = .26$, $p < .001$), and denial ($\beta = .31$, $p < .001$) predicted follow-up PTSS. Lastly, the relationship between sex and follow-up PTSS was fully mediated by self-blame and denial. The final model explained over one third of the variance in PTSS after SERE ($R^2 = 0.37$).

4. Discussion

This study examined the role of sex differences in coping as a potential factor that might explain disproportionate rates of PTSD between men and women. Using a sample of male and female service members completing a highly stressful mock-captivity exercise, this study identified key sex differences in coping and in the relationships between coping and psychological distress, specifically PTSS (as measured by the revised Impact of Events Scale [IES-R]; Weiss & Marmar, 1997). To our knowledge, this is the first study to make sex comparisons of coping styles in a contemporary sample of service members using a controlled, prospective design.

This study identified several sex differences in the use of specific coping strategies. After controlling for education, women were significantly more likely than men to report using self-blame, denial, and positive reframing coping strategies than men were. Although

not significant, women's scores on the self-distraction and planning coping strategies were also higher than men's. These results are in line with previous studies that reported women were more likely to use all types of coping strategies, including those classified as maladaptive (i.e., self-blame, denial) and adaptive (i.e., positive reframing; Nolen-Hoeksma, 2012; Tamres et al., 2002; Ullman & Filipas, 2005). Unfortunately, it is unknown why women report using more coping strategies than men. One hypothesis is that women may perceive stressful events as more threatening than men do, which increases their perceived need to cope (Nolen-Hoeksma, 2012; Tamres et al., 2002). It is plausible that the women in this sample felt a greater sense of threat during the mock-captivity exercise, but this was not assessed. Future research should include measures of threat appraisal to elucidate the reasons for higher use of coping strategies among women, particularly in military settings. Another explanatory factor may be stigma; men may avoid reporting use of coping strategies, particularly those associated with emotional expression, in an effort to conform to gender role expectations (Nolen-Hoeksma, 2012).

This study used path analysis to delineate the relationships between sex, coping, and follow-up distress. Only two coping strategies, self-blame and denial, emerged as significant mediators between sex and psychological distress following SERE. Two additional strategies, behavioral disengagement and self-distraction, were directly related to follow-up distress, but planning was not related to follow-up distress. In agreement with past research, these results indicate the use of maladaptive coping strategies may increase the risk of PTSD, but the use of adaptive strategies may have no relationship to future psychological outcomes (Nolen-Hoeksma, 2012). For example, in a smaller study of military survival school students, use of passive and emotion-focused coping prior to survival training predicted future psychological distress (Taylor et al., 2009). These data also reiterate what has been repeatedly shown in studies of victims of interpersonal violence: self-blame may be a key target for psychological skills interventions (Fairbank, Hansen, & Fitterling, 1991; Ullman & Filipas, 2005; Ullman, Townsend, Filipas, & Starzynski, 2007).

This study's model assessed the impact of both prior trauma and prior distress on coping and psychological distress, due to research suggesting past traumatic experiences, may sensitize individuals to future trauma (Breslau, 2009; Breslau et al., 1999; Breslau et al., 2008; Brewin et al., 2000; Ehlers & Clark, 2000; Johnsen et al., 2002; Olf et al., 2007). This notion is partially supported by the current results; prior trauma was indirectly related to follow-up distress through both prior distress and self-distraction. However, baseline distress also mediated the relationship between prior trauma and planning. This result is somewhat surprising because planning is considered an adaptive or active coping strategy and was not

⁶ When analyzed without allowing the coping strategies to correlate, the full hypothesized model yields the following fit indices: $\chi^2(57) = 161.7$ ($p < .001$); CFI = 0.58; RMSEA = 0.09; PCFI = 0.31.

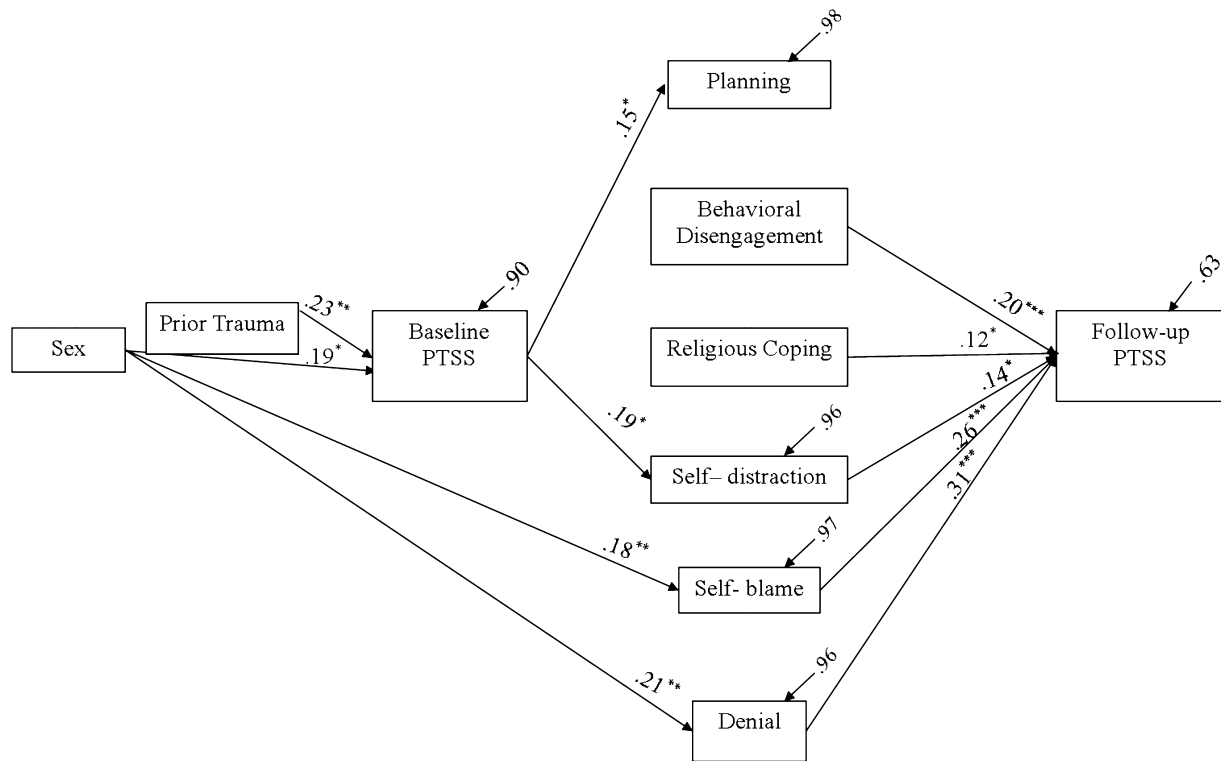


Fig. 2. Standardized regression coefficients for the interrelationships between sex, pre-SERE trauma and psychological distress, coping strategies, and post-SERE psychological distress. PTSS, post-traumatic stress symptoms; SERE, Survival, Evasion, Resistance, and Escape training.

associated with follow-up distress in this study. Further investigations of the coping–psychological distress relationship should continue to explore the effect of prior trauma and distress.

Several limitations of this study must be noted. First, this study did not assess individual threat appraisal of the mock-captivity exercise. Research suggests that an individual's judgment of how dangerous the situation is may influence the coping strategies used, therefore future research should also include a measure of threat appraisal (Olff et al., 2007; Tamres et al., 2002). Second, this study did not assess personality, which many researchers believe is a determinant of coping style (Bolger, 1990; Connor-Smith & Flachsbart, 2007; Vollrath, 2001). However, evidence suggests personality is more strongly related to dispositional coping than the situation-specific coping assessed in this study (Connor-Smith & Flachsbart, 2007). Third, it is important to note that PTSS, not diagnosed PTSD, was measured in this study. Although PTSS, as measured by the Impact of Events Scale, has been shown to predict PTSD (Shalev, Peri, Canetti, & Schreiber, 1996), interpretation of these results is limited by the lack of psycho-diagnostic assessment of PTSD. Fourth, time since last trauma exposure was not assessed in this study, which may have implications for which coping strategies participants used during SERE and could also explain changes in PTSS as a result of SERE. As noted previously, individuals with prior trauma exposure may become sensitized to future trauma and thus future studies should account for the time lag between past and current exposure. Fifth, although females were oversampled for the present study, they constituted only about a quarter of the total sample; as is always the case, point estimates based on the smaller sample (in this case, women) are likely to be less precise than those for the larger sample (in this case, men). Finally, the participants in this study represent a high-functioning sub-group of the military, so the results may not generalize to other military occupations, or to civilian populations. The strengths of this study include the use of a standardized stress event, the inclusion of measures of prior trauma and psychological distress, and the short time

lag between the conclusion of the stress event and the follow-up survey.

This study adds to the existing body of literature regarding sex differences in coping and the relationship between coping and psychological distress in military personnel. These findings may help to elucidate the underlying causes of the disparate rates of psychological disorders in men and women following traumatic exposure. The results of this study indicate that service members may benefit from psychological skills training that targets specific coping strategies prior to entering stressful training exercises and/or combat. Moreover, these data suggest coping skills training may need to be tailored to address the unique needs of men and women.

Conflict of interest and sources of funding

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14. ABSTRACT A wealth of research has examined psychological responses to trauma among male service members, but few studies have examined sex differences in response to trauma, such as coping strategies. This study assessed coping strategies used by service members completing an intensely stressful mock-captivity exercise, compared strategies by sex, and assessed the relationship between coping and posttraumatic stress symptoms (PTSS). Two hundred service members (78% male) completed self-report surveys before and after mock captivity. Surveys assessed demographics, service characteristics, PTSS, and coping strategies used during mock captivity. Participants used seven coping strategies: denial, self-blame, religion, self-distraction, behavioral disengagement, positive reframing, and planning. Women used denial ($p \leq .01$), self-blame ($p \leq .05$), and positive reinterpretation ($p \leq .05$) strategies more frequently than men, and they had higher PTSS levels following the exercise. Structural equation modeling showed that the relationship between sex and PTSS was fully mediated by coping strategies. The results of this study suggest that higher levels of PTSS among females may be mitigated by reducing their use of coping strategies associated with poorer psychological outcomes.					
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