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Changes in Social Adjustment With Cognitive Processing Therapy: Effects of Treatment and Association With PTSD Symptom Change

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The current study sought to determine if different spheres of social adjustment, social and leisure, family, and work and income improved immediately following a course of cognitive processing therapy (CPT) when compared with those on a waiting list in a sample of 46 U.S. veterans diagnosed with posttraumatic stress disorder (PTSD). We also sought to determine whether changes in different PTSD symptom clusters were associated with changes in these spheres of social adjustment. Overall social adjustment, extended family relationships, and housework completion significantly improved in the CPT versus waiting-list condition, $\eta^2 = .08$ to .11. Hierarchical multiple regression analyses revealed that improvements in total clinician-rated PTSD symptoms were associated with improvements in overall social and housework adjustment. When changes in reexperiencing, avoidance, emotional numbing, and hyperarousal were all in the model accounting for changes in total social adjustment ($\beta = .38$ to .55). In addition, improvements in avoidance symptoms were associated with improvements in overall social, extended family, and housework adjustment ($\beta = .30$), but associated with declines in extended family adjustment ($\beta = -.34$). Results suggest that it is important to consider the extent to which PTSD treatments effectively reduce specific types of symptoms, particularly emotional numbing and avoidance, to generally improve social adjustment.

Posttraumatic stress disorder (PTSD) is a serious mental health condition, with a lifetime prevalence rate ranging from 6.8% to 9.2% in North America (Kessler et al., 2005; Van Ameringen, Mancini, Patterson, & Boyle, 2008). Cognitive– behavioral therapies (CBT) have been found to be efficacious in the treatment of the symptoms of PTSD and comorbid mental health symptoms and therefore recommended as front-line treatments for those diagnosed with the disorder (for review, see Foa, Keane, Friedman, & Cohen, 2009). Although CBT has demonstrated efficacy for these symptoms, less is known about the effects of these treatments on the myriad of psychosocial problems that accompany PTSD (see Galovski, Sobel, Phipps, & Resick, 2005 for review). The purpose of this study was to determine if different areas of social adjustment (e.g., social and leisure, family, work) improved in a wait-list controlled trial of cognitive processing therapy (CPT) for veterans with PTSD (Monson et al., 2006), as well as how changes in different PTSD symptom clusters were associated with improvements in social adjustment.

Several studies have documented improvements in psychosocial functioning as a result of psychotherapy for PTSD (e.g., Galovski et al., 2005; Monson et al., 2006, Schnurr, Hayes, Lunney, McFall, & Uddo, 2006). Galovski and colleagues (2005) found that some spheres of psychosocial functioning improved following a course of individual trauma-focused therapy (i.e., prolonged exposure or CPT) in a sample of women with PTSD secondary to sexual assault, including improvements in occupational, social/leisure, extended family, family unit, and sexual concerns and dysfunctional sexual behavior domains. The study reporting the primary outcomes of the current trial with veterans with military-related PTSD found that those veterans receiving CPT improved in overall social adjustment at posttreatment compared with those on a waiting list (Monson et al., 2006). Monson and colleagues (2006), however, did not

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examine different spheres of adjustment comprising overall social adjustment.

Extending research in this area, two studies have examined the association between changes in PTSD symptoms and social adjustment or changes in a related construct-quality of life. Using data from a psychotherapy trial comparing eyemovement desensitization and reprocessing, exposure therapy, and relaxation training for PTSD, Taylor, Wald, and Asmundson (2006) examined associations between changes in PTSD symptom clusters and changes in domains of functional impairment. They found that improvements in the reexperiencing, hyperarousal, and emotional numbing clusters were associated with improvements in the occupational functioning domain, improvements in the reexperiencing and avoidance clusters were associated with improvements in the social/leisure domain, and improvements in the reexperiencing cluster were associated with improvements in the family/home domain (Taylor et al., 2006). In a similar vein, Schnurr and colleagues examined the association between changes in PTSD symptoms and changes in a related construct, quality of life, with treatment data from a large psychotherapy trial of Vietnam veterans (Lunney & Schnurr, 2007; Schnurr et al., 2006). Although they did not find differences in overall quality of life changes from pre- to posttreatment, they found that improvements in PTSD symptoms were related to improvements in overall quality of life. These changes occurred synchronously versus in a lagged fashion from PTSD changes to quality of life changes (Schnurr et al., 2006). In a follow-up study, Lunney and Schnurr (2007) found that changes in PTSD symptom clusters were differentially associated with changes in the quality of life domains of achievement, self-expression, relationships, and surroundings. Specifically, reductions in avoidance and hyperarousal symptoms were associated with improvements in the achievement domain, reductions in reexperiencing symptoms were associated with improvements in the self-expression domain, and reductions in emotional numbing symptoms were associated with improvements in the relationships domain.

In addition to the limited treatment literature reviewed above, naturalistic cross-sectional and longitudinal studies provide additional support for patterns of differential associations between PTSD symptom clusters and domains of social adjustment (Hendrix, Erdmann, & Briggs, 1998; Kuhn, Blanchard, & Hickling, 2003; Malta, Levitt, Martin, Davis, & Cloitre, 2009; Solomon & Mikulincer, 2007). For example, in a longitudinal study of survivors of motor vehicle accidents, Kuhn and colleagues (2003) found that the emotional numbing symptom cluster consistently predicted impairment in domains of psychosocial functioning. Furthermore, in a study of individuals seeking treatment for psychological distress associated with the 9/11 World Trade Center attack, researchers found that when the clusters were taken together to predict overall social impairment, only the emotional numbing cluster emerged as a significant predictor (Malta et al., 2009). Similarly, several studies of veterans have found that intimate partner and parentchild relationship functioning is associated with the severity of emotional numbing symptoms (Riggs, Byrne, Weathers, & Litz, 1998) or the combination of avoidance and numbing (Lauterbach et al., 2007; Samper, Taft, King, & King, 2004).

Taken together, prior research recommends consideration of changes in specific PTSD symptom clusters when examining the association between PTSD treatment effects and psychosocial functioning. Although many of the PTSD symptom clusters have received at least some support with respect to their associations with domains of psychosocial functioning, the extant research reviewed above emphasizes the importance of the emotional numbing symptom cluster. This cluster has been most consistently associated with psychosocial functioning across a variety of populations, and particularly in the realm of interpersonal functioning (e.g., intimate relationship, parenting, and family domains).

Exploration of the associations between different types of PTSD symptom changes and social adjustment has potentially important treatment implications because existing individual trauma-focused treatments have been found to vary in the extent to which they improve different PTSD symptom clusters (Asmundson, Stapleton, & Taylor, 2005; Glynn et al., 1999). Moreover, prior researchers have not examined whether changes in social functioning are related to the interventions themselves that have been tested in the trials versus their effects through changes in PTSD symptom clusters. In other words, there may be more diffuse treatment effects of the interventions on psychosocial functioning that are beyond their effects of improving PTSD symptoms (e.g., cognitive interventions may generalize to more positive appraisals of relationships).

Based on prior work, we predicted that all spheres of social adjustment would improve immediately following a course of CPT compared with veterans on the wait-list. In addition, we also predicted that improvements in social adjustment would be more strongly associated with reductions in overall PTSD symptomatology and PTSD symptom clusters than with assignment to the CPT condition. The association between changes in different PTSD symptom clusters and social adjustment was also of interest. Consistent with numerous factor-analysis studies (for a review, see Friedman, Resick, Bryant, & Brewin, 2011), a 4-factor model of PTSD symptoms (i.e., reexperiencing, behavioral avoidance, emotional numbing, hyperarousal) was employed in the present study. Consistent with the extant research that has documented an association between emotional numbing symptoms and psychosocial adjustment, we hypothesized that the emotional numbing symptom cluster would be significantly associated with overall and individual domains of adjustment when tested simultaneously with other clusters in predicting changes in social adjustment.

Method

Participants

Sixty veterans (54 men, six women) recruited from a Department of Veterans Affairs (VA) Medical Center participated in the trial. To be eligible for the study, participants needed to meet the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association [APA], 2000) diagnostic criteria for PTSD secondary to a military-related event. The 80% of participants prescribed psychotropic medications had to be on a stable regimen for at least 2 months prior to starting the study. In addition, participants could not have a current uncontrolled psychotic or bipolar disorder, current substance dependence (substance abuse was not exclusionary), significant cognitive impairment, or be imminently suicidal or homicidal. Consistent with secondary outcome results presented in the parent publication (Monson et al., 2006), a subsample of 46 veterans who completed treatment, as well as the pretreatment and posttreatment/10 weeks of waiting assessments, was included. Most of the participants were male (89.31%), Caucasian, non-Hispanic (89.1%), married (58.7%), endorsed combat trauma as their index trauma (78.3%), and had a concurrent comorbid diagnosis (71.7%). Approximately half (47.8%) of the veterans had a PTSD-related disability (i.e., rated by the U.S. Veterans Benefits Administration as being disabled because of their PTSD diagnosis and offered related entitlements as a result). The mean age was 54.3 (SD = 6.7) years, and the distribution of participants by period of military service was Korean war (4.3%), Vietnam war (84.8%), post-Vietnam (2.2%), and Gulf war I (8.7%). There were no pretreatment differences across treatment conditions on the social adjustment or PTSD symptom severity scores for the subsample of participants included in this study.

Measures

The Clinician-Administered Posttraumatic Stress Disorder Scale (CAPS; Blake et al., 1995) was used to determine PTSD diagnostic status according to the *DSM-IV-TR* (APA, 2000). The CAPS is a widely used clinician-rated interview for establishing the diagnosis of PTSD (i.e., symptoms met criteria if the frequency was ≥ 1 and severity was ≥ 2 ; total severity scores also had to be ≥ 45). It has been found to have strong psychometric properties (Weathers, Keane, & Davidson, 2001). To assess reliability, 7.5% of CAPS assessments were evaluated by an independent doctoral-level clinical psychologist. Reliability for CAPS administration and internal consistency was excellent (intraclass correlation was .72 to .99 across symptom clusters; $\alpha = .83$).

The self-report version of the Social Adjustment Scale (SAS; Weissman & Bothwell, 1976) was used to measure social adjustment in the following domains: spouse (i.e., role as a spouse), family (i.e., being a member of the family unit), extended family (i.e., relationships with extended family members), housework, schoolwork, work, social and leisure activ-

ities, parenting, and income. The SAS consists of 54 items, which are rated on a 5-point scale, ranging from 1 to 5. Each anchor on the SAS differs according to whether the question assesses frequency, quality, or individual emotions and opinions. For example, anchors for an item measuring days missed from work are: $1 = no \ days \ missed$, $2 = one \ day$, $3 = I \ missed$ about half the time, 4 = missed more than half the time but did make at least one day, 5 = I did not work any days. Total SAS and specific domain scores are determined by calculating a mean score of all endorsed items on the scale or domain, respectively. Higher scores indicate poorer adjustment. The SAS has been found to have good psychometric properties, including adequate internal consistency (Cronbach's $\alpha = .74$; Weissman, Prusoff, Thompson, Harding, & Myers, 1978), good convergent validity (Weissman & Bothwell, 1976), and adequate test-retest reliability (r = .74; Resick, Calhoun, Atkeson, & Ellis, 1981). Internal consistency for the SAS in the current study was $\alpha = .86$ for overall adjustment, but more variable for subscale scores. For social/leisure, $\alpha = .47$, $\alpha = .51$ for member of family, $\alpha =$.62 for extended family, $\alpha = .65$ for housework, $\alpha = .68$ for spouse, and $\alpha = .98$ for work. If a particular domain was not relevant for a participant, his or her data were not included in the related analysis. The domains of schoolwork and parenting were excluded in the current analyses because less than half of the sample responded to these items.

Procedure

This study was approved by the Dartmouth College, White River Junction VA Medical Center, and VA Boston Healthcare System Institutional Review Boards. A three-phase screening process was used to enroll participants into the study. After written informed consent, participants were administered the clinician interviews to determine eligibility, and if eligible, they completed the self-report materials. Eligible participants were randomly assigned to receive twice-weekly delivered CPT (whenever possible) immediately or after 10 weeks of waiting. PTSD symptoms were assessed at baseline, midtreatment (or after 3 weeks of waiting), posttreatment (or after 6 weeks of waiting), and 1-month follow-up (or after 10 weeks of waiting). Social adjustment was assessed at baseline and posttreatment (or after 6 weeks of waiting) to reduce participant burden.

Data Analyses

Separate analyses of covariance (ANCOVA) for overall and each sphere of social adjustment were used to detect differences between CPT and waiting-list conditions; the covariate was the pretreatment level of the respective sphere of social adjustment. Multiple ANCOVAs were chosen over a multivariate analysis of covariance (MANCOVA) to conserve statistical power (Tabachnick & Fidell, 2007). Bivariate correlations were then calculated between residualized change scores on the CAPS for total and symptom cluster scores and residualized changes on the social adjustment subscales, collapsing across treatment condition, to determine the association between changes in PTSD symptoms and various types of social adjustment.

	•		•		•							
		Cogniti	ve processi	ng therapy		Waitlist						
		Base	eline	Posttre	atment		Base	eline	6-Weeks p	ostbaseline		
Variable	n	М	SD	М	SD	п	М	SD	М	SD		
Total	20	78.25	12.66	51.20	23.15	26	76.31	17.71	74.58	22.12		
Reexperiencing	20	23.00	6.34	15.95	9.42	26	19.38	7.72	18.46	9.63		
Avoidance	20	10.95	3.17	6.30	5.10	26	11.46	3.81	10.27	4.15		
Numbing	20	18.60	5.14	9.90	9.16	26	20.35	6.90	22.31	7.02		
Hyperarousal	20	25.70	5.75	19.05	8.79	26	25.11	5.44	23.54	7.55		

Table 1				
Descriptive Statistics for the CAPS a	s a Function	of Condition	and Time of	Measurement

Note. PTSD = Posttraumatic stress disorder; CAPS = Clinician-Administered PTSD Scale.

For those domains in which there were significant social adjustment changes in CPT versus waiting-list conditions, multiple hierarchical regression analyses were conducted predicting posttreatment spheres of social adjustment. Respective baseline SAS subscale scores were entered in Step 1 to control for initial levels of social adjustment (statistically analogous to residualized changes described above). Condition assignment was entered in Step 2 with immediate CPT coded 1 and waiting list coded 0. Residualized change scores for total CAPS from baseline to posttreatment were entered at Step 3 to determine if there was additional variance in posttreatment SAS scores that was not captured by condition assignment. To investigate the relative importance of different individual PTSD symptom cluster changes, additional models were constructed in which baseline SAS subscale scores were entered in Step 1, condition assignment was entered in Step 2, and residualized change scores for all four symptom clusters of CAPS from baseline to posttreatment were simultaneously entered as a block at Step 3. Separate models were constructed for SAS total and subscales. Multiple analyses were conducted without adjusting for Type I error rate to conserve statistical power in an already small sample and because specific hypotheses were made for the analyses.

Results

Descriptive statistics for the CAPS and SAS as a function of condition and time of measurement are provided in Table 1. There were no significant differences between the conditions across the variables at baseline assessment. As shown in Table 2, results of the multiple ANCOVAs indicated that there were significant improvements in SAS-Total, SAS-Extended family, and SAS-Housework when CPT and waitlist were compared. Bivariate correlations revealed significant associations between improvements in CAPS Total PTSD symptoms and SAS-Total, SAS-Spouse, SAS-Extended family, SAS-Social and leisure, and SAS-Housework where the *rs* ranged from .43 to .65; *ps* \leq .001 to .028. Improvements in CAPS reexperiencing symptoms were associated with improvements in SAS-Total (r = .39, p = .008) and SAS-Social and leisure (r = .52, p < .001). Improve

ments in CAPS effortful avoidance symptoms were associated with improvements in SAS-Total, SAS-Social and leisure, and SAS-Housework (rs ranged from .39 to .54; $ps \le .001-.01$). Improvements in CAPS emotional numbing symptoms were associated with improvements in SAS-Total, SAS-Social and leisure, and SAS-Housework (rs ranged from .43 to .68 $ps \le .001-.004$). Improvements in CAPS hyperarousal symptoms were associated with improvements with SAS-Total, SAS-Social and leisure, and leisure, and SAS-Housework (rs ranged from .43 to .68 $ps \le .001-.004$). Improvements in CAPS hyperarousal symptoms were associated with improvements with SAS-Total, SAS-Social and leisure, and leisure, and SAS-Housework (rs ranged from .38 to .41; $ps \le .001$ to .019; correlation table is available from the first author).

Analyzing those spheres in which CPT resulted in improved social adjustment (i.e., total, housework, extended family) in the hierarchical linear regression models, we found that improvements in CAPS total symptoms were associated with improvements in SAS-Total and SAS-Housework. After taking into account CAPS total symptom changes, condition assignment was no longer statistically significant.

In the analyses in which changes in the four symptom clusters simultaneously predicted changes in total social adjustment, housework, and extended family, improvements in CAPS emotional numbing symptoms were associated with improvements in SAS-Total, SAS-Extended family, and SAS-Housework. Likewise, improvements in CAPS effortful avoidance symptoms were associated with improvements in SAS-Housework. Improvements in CAPS effortful avoidance symptoms, however, were also associated with declines in SAS-Extended family. Improvements in CAPS reexperiencing and hyperarousal symptoms were not associated with improved overall social adjustment or individual spheres of adjustment (see Table 3).

Discussion

This study expands upon our current understanding of the effects of a completed course of CPT on the impairments in social adjustment associated with PTSD. More specifically, it is among the first to examine the association between changes in specific types of PTSD symptoms and changes in social adjustment, and the potential for larger, more diffuse effects

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Variable	Cogn	Waitlist										
	Baseline		Posttreatment		Baseline		6-Weeks postbaseline					
	M	SD	М	SD	М	SD	М	SD	df	F	η^2	p
Total	2.48	0.39	2.24	0.46	2.68	0.54	2.64	0.43	1(43)	6.77	.11	.013
Spouse	2.29	0.47	2.17	0.48	2.56	0.61	2.63	0.67	1(34)	3.01	.06	.092
Family member	2.81	0.89	2.30	0.96	2.67	0.98	2.64	0.98	1(40)	2.61	.05	.114
Extended family	2.14	0.39	1.96	0.54	2.11	0.44	2.24	0.54	1(42)	6.12	.08	.017
Social and leisure	2.80	0.73	2.63	0.68	3.24	1.10	3.17	0.81	1(41)	3.29	.06	.077
Housework	2.38	0.65	2.03	0.70	2.67	0.67	2.58	0.59	1(36)	4.86	.09	.034
Work	3.68	1.71	3.26	1.94	3.45	1.64	3.20	1.51	1(37)	0.00	.00	.950
Income	1.95	1.15	2.00	1.26	2.19	1.55	2.12	1.42	1(43)	0.01	.00	.938

Descriptive Statistics for the Social Adjustment Scale (SAS) and Analysis of Covariance Results with Condition Predicting Posttreatment Social Adjustment, Controlling for Pretreatment Social Adjustment

Note. PTSD = Posttraumatic stress disorder; SAS = Social Adjustment Scale; CAPS = Clinician-Administered PTSD Scale. Social adjustment measured with the self-report version of the SAS (Weissman & Bothwell, 1976). PTSD symptoms measured with the CAPS (Blake et al., 1995).

of the treatments above and beyond improving PTSD symptoms to enhance social adjustment. Contrary to hypotheses, only overall, extended family, and housework adjustment significantly improved as a result of receiving CPT when compared with waitlist. Simultaneously taking into account changes in the different PTSD symptom clusters, improvements in emotional numbing symptoms were associated with overall social adjustment improvements and specific improvements in extended family and housework. Similarly, improvements in effortful avoidance symptoms were related to improvements in housework adjustment in these analyses. Improvements in effortful avoidance symptoms, however, were also associated with declines in extended family adjustment when taking into account changes in the other PTSD symptom clusters. Finally, assignment to CPT versus waiting list was not associated with social adjustment changes after controlling for changes in PTSD symptoms.

Table 2

Consistent with prior research with veterans (e.g., Lunney & Schnurr, 2007) and female assault victims (e.g., Galovski et al., 2005), not all spheres of psychosocial functioning were found to improve with this individual, trauma-focused treatment. Lunney and Schnurr (2007) commented that the minimal improvements in quality of life found in their study of veterans may have been related to the minimal changes in PTSD symptoms found in the parent treatment trial. The trial from which the current data came found more robust improvements in PTSD symptoms compared with waiting list (g = 1.12 for total CAPS at posttreatment). Thus, our results do not seem to be a product of minimal changes in PTSD symptoms due to treatment. Moreover, the relatively small effect sizes for the social adjustment changes suggest that the lack of significant findings is not necessarily related to the sample size.

We assert that the variable effects on social functioning found in this study and in other treatment trials may be related to the more intrapersonal and trauma-specific nature of the treatment. CPT is primarily focused on the processing of individual trauma memories, and the beliefs and emotions emanating from traumatic events. Although there is a specific focus later in the protocol on cognitions related to others, the orientation remains on the individual's own cognitions, with minimal interpersonally oriented skill development. The lack of a significant condition effect after controlling for the changes in PTSD symptoms in the hierarchal regression analyses seems to corroborate this point. In other words, the treatment effects of CPT seem to be more specific to PTSD and perhaps comorbid symptoms (e.g., depression, guilt). It is interesting to consider that CPT was originally tested in a group format (Resick & Schnicke, 1992), and there is an ongoing trial comparing individual versus group delivery of CPT (Resick & Schuster, 2009). Future research may reveal that this interpersonal context of treatment delivery will yield more robust social functioning effects.

Toward the end of building PTSD treatments with broader psychosocial effects, our study and prior observational and treatment studies argue that emotional numbing symptoms and behavioral avoidance symptoms are distinct and important treatment targets. By their very nature, emotional numbing and avoidance symptoms would seem likely to have more social ramifications than reexperiencing and hyperarousal symptoms. For example, individuals who experience high levels of avoidance and emotional numbing are less likely to be interactive and emotionally available in relationships and other social domains. In a related vein, perceived emotional support from others (Price, Gros, Strachan, Ruggiero, & Acierno, 2011) and family emotional health more generally (Tarrier, Sommerfield, Table 3

Monson et al.

		U	0		v		÷		Ŭ			
					Sphere of social functioning							
	Overall				Extended Family				Housework			
Predictor	ΔR^2	В	SE	β	ΔR^2	В	SE	β	ΔR^2	В	SE	β
			Tot	al CAP	S PTSD	symptor	ns					
Step 1						• •						
Baseline SAS		0.49	0.13***	.50		0.82	0.16***	.61		0.57	0.14***	.55
Step 2	.10*				.08*				.08*			
Baseline SAS		0.43	0.12**	.44		0.83	0.15***	.62		0.51	0.14**	.49
Condition assignment		-0.31	0.12*	33		-0.31	0.13*	28		-0.41	0.18*	30
Step 3	.21***				.02				.17*			
Baseline SAS		0.40	0.10***	.40		0.82	0.16***	.61		0.42	0.12**	.40
Condition assignment		-0.03	0.12	03		-0.22	0.15	20		-0.05	0.18	04
CAPS Total		0.01	0.00***	.55		0.00	0.00	.16		0.02	0.00**	.51
			CAI	PS PTSI	O Sympt	tom clust	ers					
Step 1					• •							
Baseline SAS		0.49	0.13***	.50		0.82	0.16***	.61		0.57	0.14***	.55
Step 2	.10*				.08*				.08*			
Baseline SAS		0.43	0.12***	.44		0.83	0.15***	.62		0.51	0.14**	.49
Condition assignment		-0.31	0.12*	33		-0.31	0.13*	28		-0.41	0.18*	30
Step 3	.26***				.14*				.25**			
Baseline SAS		0.38	0.10***	.39		0.82	0.14***	.61		0.44	0.12**	.43
Condition assignment		0.08	0.13	.09		-0.18	0.15	17		0.14	0.20	.10
CAPS Reexperiencing		0.00	0.01	.02		0.00	0.01	.03		-0.01	0.01	07
CAPS Avoidance		0.01	0.01	.18		-0.04	0.02**	34		0.05	0.02*	.30
CAPS Numbing		0.03	0.01**	.55		0.02	0.01*	.38		0.03	0.01*	.42
CAPS Hyperarousal		0.01	0.01	.07		0.01	0.01	.07		0.01	0.01	.11

Hierarchical Linear Regression Predictin	g Changes in Social Adjustmer	nt by Study Condition and	Changes in PTSD Symptoms
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Note. PTSD = Posttraumatic stress disorder; SAS = Social Adjustment Scale; CAPS = Clinician Administered PTSD Scale. Cognitive processing therapy treatment condition was coded 1 and the waiting-list condition was coded 0. PTSD symptoms total $R^2 = .56^{***}$, n = 46 (Overall), .47^{***}, n = 45 (Extended family), .56^{***}, n = 39 (Housework). PTSD Symptom clusters total $R^2 = .62^{***}$, n = 46 (Overall), .59^{***}, n = 45 (Extended family), .56^{***}, n = 39 (Housework).

p < .05. p < .01. p < .01. p < .001.

& Pilgrim, 1999) has been associated with individual evidencebased PTSD treatment outcomes. Taken together, these results suggest that emotional processes should be specifically targeted in our PTSD interventions to have broader social adjustment effects and to improve the efficacy of our treatments by facilitating patients' receipt of emotional support by others.

The finding that improvements in avoidance symptoms were associated with decreased adjustment in extended family functioning is a cautionary note that behavioral avoidance improvements alone may not be sufficient to improve social adjustment. Increased contact with family members due to decreased avoidance, unaccompanied by improved interpersonal skills to interact in these relationships, may lead to higher conflict and lower satisfaction. Given the chronic nature of this sample and most samples of treatment-seeking individuals, these relationships may be marked by years of conflict, negative emotions, physical and emotional distance, or a history of physical or emotional aggression. Some might argue that the veterans and their families need additional time after treatment to improve in their functioning. Schnurr and colleagues' (2006) study indicating that quality of life changes are more likely to improve alongside PTSD changes than to lag behind them suggests that time alone may be insufficient for psychosocial adjustment improvements. Recent innovations in family-based treatments for PTSD (e.g., Monson & Fredman, 2012; Sautter, Glynn, Thompson, Franklin, & Han, 2009), as well as individual or group-based treatments for PTSD that incorporate the use of interpersonal skills, could also be used to improve familial relationships (e.g., Cloitre, Koenen, Cohen, & Han, 2002; Cloitre et al., 2010; Frueh, Turner, Beidel, Mirabella, & Jones, 1996; Levitt, Malta, Martin, Davis, & Cloitre, 2007).

Another possible and related explanation for the association between improvements in avoidance symptoms and decreases in extended family adjustment may be nonsignificant improvements in the hyperarousal cluster of PTSD symptoms (Monson et al., 2006). Although participants experienced a reduction in their avoidance symptoms, remaining irritability may be related to poorer adjustment in these relationships. These findings should be submitted to further replication before more definitive conclusions can be made.

Limitations of this study include the relatively small sample size and minimal variation in demographics (i.e., predominance of male, Caucasian, Vietnam veterans). The limited sample size could have resulted in an inflated Type I error rate because multiple analyses were conducted without adjusting the alpha value. Thus, future studies with larger samples are needed to replicate these findings. This sample did not allow us to include all subscales of the social adjustment measure (e.g., schoolwork and parenting) because some of these subscales were not relevant to this particular sample. Furthermore, some of the SAS subscales may be less sensitive to change or may not be expected to change as a function of treatment or PTSD symptom reduction (e.g., SAS income). Thus, future research should focus on using multimodal assessments of social adjustment to better understand how this construct is affected by treatment and changes in PTSD symptoms. Given the younger demographic of the current conflicts in Iraq and Afghanistan, future research might be directed at examining the relationship between PTSD symptoms and social functioning in this relatively younger population. Future studies might also utilize a longitudinal design to determine long-term impact of changes in PTSD symptoms and changes in spheres of social functioning. Nevertheless, future studies in this area will ultimately help us to improve the reach of our existing therapies and to facilitate innovation of stand-alone or adjunctive therapies that can ameliorate the many psychosocial problems that those with PTSD suffer.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Asmundson, G. J. G., Stapleton, J. A., & Taylor, S. (2005). Are avoidance and numbing distinct PTSD symptom clusters? *Journal of Traumatic Stress*, 17, 467–475. doi:10.1007/s10960–004–5795–7
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S., & Keane, T. M. (1995). The development of a Clinician-Administered PTSD Scale. *Journal of Traumatic Stress*, 8, 75– 90. doi:10.1007/BF02105408
- Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, 70, 1067–1074. doi:10.1037/0022–006X.70.5.1067
- Cloitre, M., Stovall-McClough, C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., . . . Petkova, E. (2010). Treatment for PTSD related to childhood abuse: A randomized controlled trial. *American Journal of Psychiatry*, 167, 915–924. doi:10.1176/appi.ajp.2010.09081247
- Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (Eds.). (2009). Effective treatments for PTSD: Practice guidelines from the international society of traumatic stress studies (2nd ed.). New York: Guilford Press.
- Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety*, 28, 750–769. doi:10.1002/da.20767

- Frueh, B. C., Turner, S. M., Beidel, D. C., Mirabella, R. F., & Jones, W. J. (1996). Trauma management therapy: A preliminary evaluation of a multicomponent behavioral treatment for chronic combat-related PTSD. *Behaviour Research and Therapy*, 34, 533–543. doi:10.1016/0005– 7967(96)00020–4
- Galovski, T. E., Sobel, A. A., Phipps, K. A., & Resick, P. A. (2005). Trauma recovery: Beyond posttraumatic stress disorder and other axis I symptom severity. In T. A. Corales (Ed.), *Trends in posttraumatic stress disorder research* (pp. 207–227). Hauppauge, NY: Nova Science.
- Glynn, S. M., Eth, S., Randolph, E. T., Foy, D. W., Urbaitis, M., Boxer, L., ... Crothers, J. (1999). A test of behavioral family therapy to augment exposure for combat-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 67, 243–251. doi:10.1037/0022–006X.67.2 .243
- Hendrix, C. C., Erdmann, M. A., & Briggs, K. (1998). Impact of Vietnam veteran's arousal and avoidance on spouses' perceptions of family life. *The American Journal of Family Therapy*, 26, 115–128.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, 62, 593–602. doi:10.1001/archpsyc.62.6.593
- Kuhn, E., Blanchard, E. B., & Hickling, E. J. (2003). Posttraumatic stress disorder and psychosocial functioning within two samples of MVA survivors. *Behaviour Research and Therapy*, 41, 1105–1112.
- Lauterbach, D., Bak, C., Reiland, S., Mason, S., Lute, M. R., & Earls., L. (2007). Quality of parental relationships amongst persons with a lifetime history of posttraumatic stress disorder. *Journal of Traumatic Stress*, 20, 161–172. doi:10.1002/jts.20194
- Levitt, J. T., Malta, L. S., Martin, A., Davis, L., & Cloitre, M. (2007). The flexible application of a manualized treatment for PTSD symptoms and functional impairment related to the 9/11 World Trade Center attack. *Behaviour Research and Therapy*, 45, 1419–1433. doi:10.1016/j.brat.2007.01.004
- Lunney, C. A., & Schnurr, P. P. (2007). Domains of quality of life and symptoms in male veterans treated for posttraumatic stress disorder. *Journal of Traumatic Stress*, 20, 955–964. doi:10.1002/jts.20269
- Malta, L. S., Levitt, J. T., Martin, A., Davis, L., & Cloitre, M. (2009). Correlates of functional impairment in treatment-seeking survivors of mass terrorism. *Behavior Therapy*, 40, 39–49. doi:10.1016/j.beth.2007.12.007
- Monson, C. M., & Fredman, S. J. (2012). Cognitive-behavioral conjoint therapy for posttraumatic stress disorder. New York: Guilford Press.
- Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 74, 898–907. doi:10.1037/0022–006X.74 .5.898
- Price, M., Gros, D. F., Strachan, M., Ruggiero, K. J., & Acierno, R. (2011). The role of social support in exposure therapy for Operation Iraqi Freedom/Operation Enduring Freedom veterans: A preliminary investigation. *Psychological Trauma: Theory, Research, Practice, and Policy.* doi:10.1037/a0026244
- Resick, P. A., Calhoun, K. S., Atkeson, B. M., & Ellis, E. M. (1981). Social adjustment in victims of sexual assault. *Journal of Consulting and Clinical Psychology*, 49, 705–712. doi:10.1037/0022–006X.49.5.705
- Resick, P. A., & Schnicke, M. K. (1992). Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology*, 60, 748–756. doi:10.1037/0022–006X.60.5.748
- Resick, P.A., & Schuster, J. S. (2009, September). Individual versus Group Cognitive Processing Therapy for Combat-Related PTSD: A STRONG STAR

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Project. Paper presented at the Military Health Research Forum, Kansas City, MO.

- Riggs, D. S., Byrne, C. A., Weathers, F. W., & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: Problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress*, 11, 87–101. doi:10.1023/A:1024409200155
- Samper, R. E., Taft, C. T., King, D. W., & King, D. W. (2004). Posttraumatic stress disorder symptoms and parenting satisfaction among a national sample of male Vietnam veterans. *Journal of Traumatic Stress*, 17, 311–315. doi:10.1023/B:JOTS.0000038479.30903.ed
- Sautter, F., Glynn, S., Thompson, K. E., Franklin, C. L., & Han, X. (2009). A couple-based approach to the reduction of PTSD avoidance symptoms: Preliminary findings. *Journal of Marital and Family Therapy*, 35, 343–349.
- Schnurr, P. P., Hayes, A. F., Lunney, C. A., McFall, M., & Uddo, M. (2006). Longitudinal analysis of the relationship between symptoms and quality of life in veterans treated for posttraumatic stress disorder. *Journal* of Consulting and Clinical Psychology, 74, 707–713. doi:10.1037/0022– 006X.74.4.707
- Solomon, Z., & Mikulincer, M. (2007). Posttraumatic intrusion, avoidance, and social functioning: A 20-year longitudinal study. *Journal of Consulting and Clinical Psychology*, 75, 316–324. doi:10.1037/0022–006X.75.2 .316

- Tabachnick, B. C., & Fidell, L. S. (2007). Using multivariate statistics (5th ed.). Boston, MA: Allyn and Bacon.
- Tarrier, N., Sommerfield, C., & Pilgrim, H. (1999). Relatives' expressed emotion (EE) and PTSD treatment outcome. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences*, 29, 801–811. doi:10.1017/S0033291799008569
- Taylor, S., Wald, J., & Asmundson, G. J. G. (2006). Factors associated with occupational impairment in people seeking treatment for posttraumatic stress disorder. *Canadian Journal of Community Mental Health*, 25, 289–301.
- Van Ameringen, M., Mancini, C., Patterson, B., & Boyle, M. H. (2008). Posttraumatic stress disorder in Canada. CNS Neuroscience & Therapeutics, 14, 171–181. doi:10.1111/j.1755–5949.2008.00049.x
- Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinicianadministered PTSD scale: A review of the first ten years of research. *Depression and Anxiety*, 13, 132–156. doi:10.1002/da.1029
- Weissman, M. M., & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. Archives of General Psychiatry, 33, 1111–1115.
- Weissman, M. M., Prusoff, B. A., Thompson, W. D., Harding, P. S., & Myers, J. K. (1978). Social adjustment by self-report in a community sample and in psychiatric outpatients. *Journal of Nervous and Mental Disease*, 166, 317–326.