

Effects of Three PTSD Treatments on Anger and Guilt: Exposure Therapy, Eye Movement Desensitization and Reprocessing, and Relaxation Training*

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This study sought to investigate the efficacy of prolonged exposure, eye movement desensitization and reprocessing, and relaxation training on trait anger and guilt and on trauma-related anger and guilt within the context of posttraumatic stress disorder (PTSD) treatment. Fifteen PTSD patients completed each treatment and were assessed at posttreatment and at 3-month follow-up. All three treatments were associated with significant reductions in all measures of anger and guilt, with gains maintained at follow-up. There were no significant treatment differences in efficacy or in the proportion of patients who worsened on anger or guilt measures over the course of treatment. Between-treatment effect sizes were generally very small. Results suggest that all three treatments are associated with reductions in anger and guilt, even for patients who initially have high levels of these emotions. However, these PTSD therapies may not be sufficient for treating anger and guilt; additional interventions may be required.

In recent years, there has been growing interest, for both practical and theoretical reasons, regarding the relationship between posttraumatic stress disorder (PTSD) and anger and guilt. In terms of theoretical relevance, evidence has suggested that rumination about the traumatic event—in which the person dwells on questions such as “Why did this happen to me?” “What could I have done to prevent

it from happening?” or “How could they get away with doing this to me?”—appears to contribute to PTSD and to persistent anger and guilt (e.g., Lee, Scragg, & Turner, 2001; Murray, Ehlers, & Mayou, 2002). Thus, PTSD and clinically significant anger and guilt may have mechanisms in common. In addition, anger and guilt may exacerbate PTSD symptoms (Chemtob, Novaco, Hamada, & Gross,

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1997; Kubany & Watson, 2002). For example, anger-related ruminative thoughts about the trauma may trigger reexperiencing symptoms and may fuel hyperarousal. Consistent with this possibility, the severity of anger and guilt are correlated with the severity of PTSD symptoms (e.g., Henning & Frueh, 1997; Riggs, Dancu, Gershuny, Greenberg, & Foa, 1992).

Clinically, there are several reasons why anger and guilt are important to consider when treating PTSD. Pretreatment levels of anger have been linked to poor outcome in many (but not all) studies of PTSD treatments (e.g., Foa, Riggs, Massie, & Yarczower, 1995; Taylor et al., 2001; but see Cahill, Rauch, Hembree, & Foa, 2003; Taylor, 2003; van Minnen, Arntz, & Keijsers, 2002). In a study intended to highlight problems with prolonged exposure (PE) for PTSD, Pitman et al. (1991) described a number of cases in which anger or guilt worsened during the course of PE therapy. Because these cases were selected to highlight problems with PE, it is not clear from Pitman et al.'s study whether the prevalence of such adverse events was common or rare. Meta-analytic comparisons of various PTSD treatments (Taylor, 2004; van Etten & Taylor, 1998) have shown that the general symptom-reduction effects of PE are not significantly different from the effects of eye movement desensitization and reprocessing (EMDR) or selective serotonin reuptake inhibitors, but that the effects of all three of these treatments are superior to other approaches (e.g., supportive therapy, benzodiazepines, tricyclic antidepressants, hypnosis); however, little is known about the prevalence of adverse effects for these empirically supported treatments.

It remains to be determined whether PE is effective in alleviating anger and guilt compared to other treatments. Likewise, it remains to be determined whether the adverse effects (e.g., worsening of anger and guilt) of PE differ from those associated with other therapies. These issues were investigated in the present study, using a secondary analysis of data collected as part of a previously reported, randomized, controlled trial comparing PE, EMDR, and relaxation training (Taylor et al., 2003). The main results of that study revealed that the three treatments did not differ in attrition, and all were associated with PTSD symptom

reduction. Compared to EMDR and relaxation training, PE (a) produced significantly larger reductions in avoidance and reexperiencing symptoms, (b) tended to be faster at reducing avoidance, and (c) tended to yield a greater proportion of participants who no longer met diagnostic criteria for PTSD after treatment. EMDR and relaxation did not differ from one another on any PTSD outcome variable.

The purpose of the present study was to compare the effects of the three treatments on trait and trauma-related anger and guilt. Such analyses were not reported in the original study. The first aim was to compare the efficacy of these treatments on trait anger and guilt and on trauma-related anger and guilt. The second aim was to compare the treatments in terms of the proportion of patients who deteriorate (worsen) on the measures of anger and guilt over the course of treatment. The final aim was to investigate whether the effects of treatments differed as a function of the pretreatment severity of anger or guilt. Selected case studies (Pitman et al., 1991) have suggested that PE may be effective in reducing mild or moderately severe levels of PTSD-related anger and guilt, but may be less effective or even countertherapeutic for reducing severe levels of these emotions. The present study allowed for preliminary investigation of the question of whether there are such severity effects for each of the three treatments.

METHOD

The following is a summary of the methodology of this study. Further details are presented in the main article for this treatment study (Taylor et al., 2003).

Participants

Participants with a *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*; American Psychiatric Association, 1994) diagnosis of PTSD as the primary (most severe) presenting problem were recruited from physician referrals and from advertisements in the local media. Inclusion criteria were (a) *DSM-IV* diagnosis of PTSD

as the primary (most severe) presenting problem, (b) over 18 years of age and able to provide written informed consent, and (c) willingness to suspend any concomitant psychological treatment and to keep doses of any psychotropic medication constant throughout the course of the study. Exclusion criteria were mental retardation, current psychotic disorder, and commencement or change in dose of psychotropic medication within the past 3 months. Personality disorders were not diagnosed; however, patients were excluded if the primary problem, as assessed during the intake interview, was something other than PTSD.

Sixty participants entered and 45 completed treatment. The number of trial entrants and number of treatment completers were as follows: EMDR: 19, 15; PE: 22, 15; and relaxation training: 19, 15, respectively. The proportion of dropouts did not differ across treatments; $\chi^2(2, N = 60) < 1.00$, *ns*, $\eta^2 = .01$. Dropouts and completers did not differ (*ps* > .05) on demographics (i.e., age, gender, ethnicity, educational attainment, occupational status), trauma type (e.g., sexual assault, road traffic collision), PTSD duration, or pretreatment scores on PTSD symptoms (i.e., reexperiencing, avoidance, numbing, or hyperarousal). For further details, see Taylor et al. (2003).

For the 60 participants entering the study, the mean age was 37 years (*SD* = 10 years), and 75% were female. Most (77%) were Caucasian, and most (78%) had completed some form of college education. Forty-two percent were employed full-time or part-time outside of the home, 15% were students, 5% were full-time homemakers, 13% were unemployed, and 25% were supported by some form of disability assistance. Forty-two percent were married or cohabiting, 32% were single, and 27% were separated or divorced.

The mean duration of PTSD was 8.7 years (*SD* = 10.8). Forty-eight percent of participants were taking some form of psychotropic medication, which remained stable in dose throughout the course of the study. Sixty-five percent had experienced more than one type of traumatic event. The most common forms were sexual assault (45%), physical assault (43%), transportation accidents (43%), and being exposed to a sudden death such as witnessing a

homicide (22%). Currently coexisting mental disorders, from most to least common, were major depressive disorder (42%), panic disorder with or without agoraphobia (31%), social anxiety disorder (12%), specific phobia (10%), generalized anxiety disorder (7%), obsessive compulsive disorder (5%), eating disorder (bulimia or binge eating disorder; 5%), anxiety disorder not otherwise specified (2%), bipolar disorder (2%), and dysthymic disorder (2%). None of the participants had currently coexisting alcohol abuse or dependence, drug abuse or dependence, or hypochondriasis.

Measures

Intake diagnoses for Axis I disorders were assessed by the Structured Clinical Interview for *DSM-IV* (SCID-IV: First, Spitzer, Gibbon, & Williams, 1996). Trauma-related anger was assessed by an item that queried the frequency of anger about trauma-related events over the past week. This item was rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*almost always*). A similar item assessed trauma-related guilt. Participants also completed the trait form of the State-Trait Anger Expression Inventory (Spielberger, 1988) and the trait form of the Guilt Inventory (Kugler & Jones, 1992). These measures assess trait anger (anger proneness) and trait guilt (guilt proneness) arising from traumata and other sources. They were completed at pretreatment, posttreatment, and follow-up.

Trauma-related and trait measures of anger and guilt were both included because the measures complement each other with their strengths and weaknesses. The single-item trauma-related measures were used because they are specific to PTSD and because they are short enough to use in a session-by-session evaluation. The trait measures were used because they are longer, well-established measures, and so are likely to have greater reliability than the single-item scales. The inclusion of trauma-related and trait measures also enabled an assessment of the breadth of treatment effects; that is, whether the treatments were specific to trauma-related guilt, for example, or whether they target guilt proneness in general.

Treatments

Protocols. Participants meeting study criteria were randomized to eight 90-min individual sessions of either PE, EMDR, or relaxation training. Detailed treatment manuals were used for each treatment. Exposure and relaxation manuals were based on Marks, Lovell, Noshirvani, Livanou, and Thrasher (1998), and EMDR was based on Shapiro (1995).

PE involved four sessions of imaginal exposure to traumatic events, followed by four sessions of in vivo exposure to harmless, but distressing, trauma-related stimuli. Exposure exercises were hierarchically arranged, from least to most distressing stimuli. Exposure exercises occupied about 60 min of each 90-min session. Imaginal exposure was repeated several times per session, with particular focus on the most disturbing aspects of the event. Sessions were audiotaped, and participants were asked to listen to the tapes for 1 hr each day for the first 4 weeks of treatment. In vivo exposure consisted of therapist-assisted exposure conducted within sessions, and exposure homework assignments. The latter consisted of live exposure for 1 hr each day for 4 weeks.

Relaxation training involved practicing three different relaxation exercises; one per session for the first three sessions. The participant then selected an exercise to practice in subsequent sessions. This consisted of either one of the three exercises or some combination thereof. Relaxation training occupied about 60 min of each 90-min session. In each session, a relaxation script was read by the therapist. The script was audiotaped, and the participant was asked to listen to it for 1 hr each day.

EMDR followed the procedures and phases described by Shapiro (1995). During the first session, participants were trained in the Safe Place exercise, which is a coping strategy for reducing distress. This exercise was practiced as a homework assignment and used thereafter as needed. If there was sufficient time in the first session, processing of a traumatic memory was initiated, which continued in subsequent sessions. The participant was asked to recall the memory and its associated features (e.g., negative self-statements), and then lateral sets of eye movements

were induced by the therapist moving her finger across the participant's field of vision. The participant then reported any thoughts, feelings, or images that arose. This new material typically became the focus of the next set of eye movements. The process continued until the distress evoked by the memory had subsided. Other EMDR methods (e.g., cognitive interweave) were used as indicated. If problems with eye movements were encountered (e.g., if they induced headaches), then an alternative form of oscillatory stimulation—hand tapping—was used (Shapiro, 1995).

Therapists. Two female therapists were randomly assigned patients from the three treatment conditions, under the ongoing supervision of a doctoral-level psychologist who also ensured that the therapists were adequately trained to deliver the three treatments. Each therapist treated approximately an equal number of patients from each treatment condition. Both therapists had completed Levels I and II training from the EMDR Institute. Therapist 1 was a master's-level psychotherapist who had practiced EMDR for 6 years. She had 12 years of experience using cognitive-behavioral interventions for psychological trauma and 14 years of experience using relaxation training. Therapist 2 was a doctoral-level clinician with 6 years of experience with PE and 2 years of experience with relaxation training. She completed Levels I and II training with the EMDR Institute for the purpose of the study. Recent analyses have shown that the magnitudes of PTSD symptom reduction from pre- to posttreatment attained by these therapists using each of PE, EMDR, and relaxation training were as large or larger than symptom reductions reported in other studies (Taylor, 2004). This underscores the adequacy of their training and the extent of their skills with the treatments used in this study.

Treatment integrity. Treatment sessions were videotaped for treatment-integrity ratings (and for treatment supervision) and were rated by independent assessors for adequacy of interventions and to identify protocol violations. Assessors rated whether treatment-nonspecific components (e.g., therapist warmth and rapport)

Table 1. Means (and *SDs*) on Measures of Anger and Guilt

	Assessment point	EMDR <i>M (SD)</i>	Exposure <i>M (SD)</i>	Relaxation <i>M (SD)</i>
Trauma-related anger	Pretreatment	1.4 (1.0)	1.8 (1.2)	2.0 (0.9)
	Posttreatment	1.1 (1.0)	1.1 (1.1)	1.1 (1.0)
	Follow-up	0.9 (1.0)	0.9 (1.0)	1.4 (1.0)
Trauma-related guilt	Pretreatment	1.3 (1.2)	1.1 (1.0)	1.5 (1.0)
	Posttreatment	0.8 (0.9)	0.6 (0.9)	0.7 (1.0)
	Follow-up	0.5 (0.8)	0.7 (1.0)	0.3 (0.6)
Trait anger	Pretreatment	17.0 (5.6)	19.7 (7.0)	21.5 (6.3)
	Posttreatment	16.7 (4.4)	18.2 (5.7)	20.1 (5.8)
	Follow-up	15.7 (3.6)	17.2 (5.6)	19.5 (5.3)
Trait guilt	Pretreatment	67.9 (14.8)	64.9 (15.9)	68.7 (10.0)
	Posttreatment	63.3 (15.2)	58.6 (10.3)	63.5 (11.5)
	Follow-up	61.9 (16.1)	58.5 (12.0)	64.0 (12.8)

Note. EMDR = Eye Movement Desensitization and Reprocessing.

were adequate, whether treatment-specific components (e.g., imaginal exposure exercises) were implemented adequately, and whether the session contained a nonprotocol intervention (e.g., cognitive restructuring during PE). Treatment integrity was found to be acceptable (for full details, see Taylor et al., 2003).

Procedure

Potential participants contacting the clinic were given a description of the study and screened for inclusion/exclusion criteria during a telephone-screening interview. Those passing the screen were invited to the clinic for an evaluation, administered by clinical staff, consisting of the SCID-IV and other measures. Written informed consent was obtained before the evaluation. Interviewers were blind to treatment condition. Accordingly, the clinic staff member who randomized patients to treatment conditions did not evaluate patients that she or he had assigned to treatment. Interviews were audiotaped to assess interrater reliability of the ratings made by the clinic staff. A doctoral-level psychologist independently rated audiotapes of 12 SCID-IV interviews. The agreement between raters for the diagnosis of PTSD was 92% ($\kappa = .80$).

The structured interviews and questionnaires were administered during the intake evaluation, at posttreatment (1 month after the end of treatment), and at follow-up (3 months after that). Measures of trauma-related anger and guilt also were administered at the beginning of each treatment session. Therapy commenced 1 to 2 weeks after the intake evaluation.

RESULTS

Treatment Main Effects

Means (and *SDs*) for each variable at each assessment point are shown in Table 1.¹ There were no significant treatment differences on pretreatment scores for any of the four anger

¹ Scores on all four measures of anger and guilt were obtained during the intake evaluation, and scores on trauma-related anger and guilt also were obtained at the beginning of the first treatment session (i.e., before therapy had actually started), 1 to 2 weeks after the intake evaluation. For the purposes of this study, the pretreatment scores for trait anger and guilt were those obtained during the intake evaluation, and pretreatment scores for trauma-related anger and guilt were those obtained at the beginning of Session 1. The scores on the trauma-related measures obtained during the intake evaluation were correlated with scores at the beginning of Session 1 to obtain estimates of the test-retest reliabilities of the measures of trauma-related anger and guilt, for the purpose of computing statistically significant changes in scores over the course of treatment.

Table 2. Treatment and Time Effects

	Treatment Main Effect Posttreatment		Treatment Main Effect Follow-Up		Time Main Effect Pre- to Posttreatment		Time Main Effect Pretreatment to Follow-Up	
	<i>F</i> (2, 41)	η^2	<i>F</i> (2, 41)	η^2	<i>t</i> (44)	η^2	<i>t</i> (44)	η^2
Trauma-related anger	<1.00	.00	<1.00	.03	3.40**	.21	3.39**	.21
Trauma-related guilt	<1.00	.01	1.84	.08	3.54**	.22	5.30**	.39
Trait anger	<1.00	.01	<1.00	.03	1.44	.05	2.53*	.13
Trait guilt	<1.00	.02	<1.00	.02	3.44**	.21	3.77**	.24

* $p < .05$. ** $p < .001$.

and guilt variables; the largest $F(2, 42) = 1.92$, *ns*, mean $\eta^2 = .05$. For each anger and guilt variable, treatment effects were analyzed by analyses of covariance, where the covariate was the pretreatment score. The results are shown in Table 2. Here, it can be seen that the treatments did not significantly differ on any variable. The treatment effect sizes were quite small (mean $\eta^2 = .03$), indicating that the type of treatment accounted for a small proportion of variance ($M = 3\%$) in posttreatment and follow-up scores.

Table 2 also shows the time effects; that is, tests of the significance of the differences between pre- and posttreatment scores, and pretreatment and follow-up scores (collapsed across treatment groups). The results, along with the pattern of means in Table 1, indicate that scores on the four variables generally declined over the course of treatment.

Worsening of Anger and Guilt

There are several methods for identifying the proportion of patients who worsen at posttreatment and follow-up, compared to their pretreatment levels. One is a liberal method based on Tarrier et al.'s (1999) criteria, where worsening is defined by an increase in scores from pre- to posttreatment or from pretreatment to follow-up. Another method is a more conservative approach, based on the computation of statistically significant change (Jacobson & Truax, 1991). Although it has been argued that the latter approach is more methodologically rigorous than the Tarrier et al. method (Devilley & Foa, 2001), there are several problems with the Jacobson and Truax (1991) approach; the primary problem is that their method is one

of many available statistical methods for computing reliable change, and researchers continue to debate which method is preferable (e.g., Maasen, 2001, 2004; Temkin, 2004). In the present study, we used both the Tarrier et al. and the Jacobson and Truax methods. The latter was computed (for $p < .05$) using Devilly's (2004) software program. This requires pretreatment *SDs* and test-retest reliability coefficients for each variable to compute the standard error of measurement. Ideally, test-retest reliability coefficients would correspond to the durations from pre- to posttreatment and from pretreatment to follow-up. Unfortunately, data for such intervals were unavailable for the measures used in the present study, and so the coefficients were estimated from the best available sources: (a) from the present study, where the measures of trauma-related anger and guilt were administered twice before treatment, once during the intake evaluation, and 1 to 2 weeks later at the beginning of the first treatment session ($r_s = .57$ and $.58$ for anger and guilt, respectively, and *SDs* = 1.0 and 1.2, respectively); (b) the 8-week test-retest correlation for the trait anger measure, as reported by Dahlen, Martin, Ragan, and Kuhlman (2004) ($r = .75$, and *SD* in present study = 6.4); and (c) the 10-week test-retest correlation for trait guilt reported by Kugler and Jones (1992) ($r = .72$, and *SD* in the present study = 13.6).

For both the Tarrier et al. (1999) and Jacobson and Truax (1991) methods, treatments were compared in terms of the proportion of patients who deteriorated on a given anger or guilt variable. Pearson's χ^2 test was used to make these comparisons (classifying patients rather than percentages), even though some of the cell sizes in the contingency

Table 3. Number (and %) of Patients With Worsening of Anger or Guilt

Method for Assessing Worsening	Assessment Interval	Variable	EMDR <i>n</i> (%)	Exposure <i>n</i> (%)	Relaxation <i>n</i> (%)	Comparison of treatments	
						$\chi^2(2, N = 45)$	η^2
Tarrow et al. (1999)							
	Pre to post	Trauma-related anger	2 (13)	4 (27)	1 (7)	2.37	.08
	Pre to post	Trauma-related guilt	1 (7)	1 (7)	1 (7)	<1.00	.00
	Pre to post	Trait anger	6 (40)	4 (27)	2 (13)	2.73	.25
	Pre to post	Trait guilt	3 (20)	4 (27)	3 (20)	<1.00	.00
	Pre to follow-up	Trauma-related anger	4 (27)	1 (13)	1 (7)	2.37	.23
	Pre to follow-up	Trauma-related guilt	0 (0)	1 (7)	0 (0)	2.05	.00
	Pre to follow-up	Trait anger	7 (47)	3 (20)	3 (20)	3.46	.24
	Pre to follow-up	Trait guilt	3 (20)	4 (27)	3 (20)	<1.00	.00
Jacobson & Truax (1991)							
	Pre to post	Trauma-related anger	1 (7)	0 (0)	0 (0)	2.05	.19
	Pre to post	Trauma-related guilt	1 (7)	1 (7)	0 (0)	1.05	.13
	Pre to post	Trait anger	0 (0)	0 (0)	1 (7)	2.05	.19
	Pre to post	Trait guilt	0 (0)	1 (7)	1 (7)	1.05	.13
	Pre to follow-up	Trauma-related anger	1 (7)	1 (7)	1 (7)	<1.00	.00
	Pre to follow-up	Trauma-related guilt	0 (0)	1 (7)	0 (0)	2.05	.00
	Pre to follow-up	Trait anger	0 (0)	1 (7)	0 (0)	<1.00	.00
	Pre to follow-up	Trait guilt	1 (7)	1 (7)	0 (0)	2.05	.13

Note. EMDR = Eye Movement Desensitization and Reprocessing. All *ps ns*.

tables were small. We used this test instead of Fisher's exact test or a χ^2 test with Yate's correction (which are commonly used when cell sizes are small) because the latter tests have severely conservative biases with regard to Type I error (Overall, Rhoades, & Starbuck, 1987). Even though we used the comparatively more liberal Pearson χ^2 , none of the results were statistically significant (see Table 3). That is, the treatments did not differ in the proportion of patients with worsening for any outcome variable, and the associated effect sizes were generally quite small, both for the Tarrow et al. method (mean $\eta^2 = .10$) and the Jacobson and Truax method (mean $\eta^2 = .10$).

Outcome as a Function of Pretreatment Severity of Anger and Guilt

To determine whether treatment outcome varied as a function of pretreatment severity of anger or guilt, we cluster analyzed participants on their pretreatment scores on the four anger and guilt variables. Cluster analysis was based on

Ward's method with squared Euclidean distance and standardized variables. Ward's method was used because it is superior to other algorithms in identifying known clusters (Overall, Gibson, & Novy, 1993). A two-cluster solution was identified. Cluster 1 ($n = 15$), compared to Cluster 2 ($n = 30$), was associated with significantly higher scores on each of the four cluster variables. Means (and *SDs*) were as follows: trauma-related anger, Cluster 1 = 2.5 (0.6), Cluster 2 = 1.3 (1.0); trauma-related guilt, Cluster 1 = 1.9 (0.9), Cluster 2 = 1.0 (1.1); trait anger, Cluster 1 = 23.9 (6.4), Cluster 2 = 17.1 (5.2); and trait guilt, Cluster 1 = 74.7 (10.9), Cluster 2 = 63.4 (13.4). Cluster comparisons for each variable yielded $t(43)$ all greater than 2.80, $p < .01$. Thus, we empirically identified clusters of participants that were high versus low on pretreatment levels of trauma-related and trait anger and guilt. The proportion of participants allocated to each cluster did not significantly differ across treatments; $\chi^2(2, N = 45) = 2.40, ns$.

To determine whether the severity of pretreatment anger or guilt influenced treatment outcome, a series of

between/within-group multivariate analyses of variance (MANOVAs) were conducted. The dependent variables were the four anger and guilt variables. The between-group variables were treatment type (PE, EMDR, or relaxation) and cluster type (high or low anger/guilt). The within-subject variable was a "time" factor, defined as either pre- to posttreatment or as pretreatment to follow-up. Thus, eight MANOVAs were conducted (i.e., four anger/guilt variables for each of two time comparisons). In each case, the Time \times Cluster interaction was nonsignificant; for all analyses, with the largest Pillai $F(1, 39) = 1.00$, *ns*, mean $\eta^2 = .003$. Similarly, all Time \times Cluster \times Treatment Type interactions were nonsignificant, with the largest Pillai $F(2, 39) = 1.90$, *ns*, mean $\eta^2 = .05$. In other words, there was no evidence that treatment outcome varied as a function of the pretreatment severity of anger or guilt.

DISCUSSION

The aims of this study were to (a) compare the efficacy of three PTSD treatments on anger and guilt, (b) compare the treatments in the terms of the incidence of worsening of anger or guilt, and (c) determine whether pretreatment severity of anger or guilt was related to treatment outcome. The results indicate that trauma-related anger and guilt declined for all three treatments over the course of therapy. Even trait anger and guilt, which are assumed to represent more stable, dispositional constructs, tended to decline over the course of treatment. There were no differences in treatment efficacy and in the incidence of treatment-related worsening of anger or guilt. The pretreatment severity of these emotions was unrelated to treatment outcome.

The finding that PE was no worse than either EMDR or relaxation training is noteworthy because Pitman et al. (1991) specifically highlighted concerns that PE could worsen anger or guilt; however, Pitman et al.'s cases were deliberately selected to illustrate problems with PE. It is not known whether these cases were representative of the patients treated by Pitman and colleagues. The findings of the present study suggest that treatment-related worsening is uncommon; however, like Pitman et al., we were able to identify some participants who had worsening of

anger or guilt over the course of treatment. The design of the present study did not enable us to determine whether treatment caused the worsening; extraneous factors such as interpersonal conflicts or other stressors occurring outside of therapy could have caused exacerbations in anger or guilt.

In line with previous reports of the efficacy of stress inoculation training in reducing anger within treatment for PTSD (e.g., Cahill et al., 2003), relaxation training also was effective in reducing anger and guilt in this study. Relaxation focuses on physiological arousal and therefore is expected to reduce anger and, to a lesser degree, guilt. There is no conceptual or empirical reason for expecting relaxation to lead to a worsening of anger or guilt, especially because relaxation training encourages patients to focus on reducing arousal by the use of calming imagery and tension-reducing physical exercises (e.g., tense-release exercises).

Although each of the three PTSD treatments was associated with reductions in anger and guilt, these treatments may not be sufficient for reducing these negative emotions. In some cases, it may be necessary to extend the course of treatment or to include a treatment that incorporates methods that specifically focus on anger or guilt. Such methods include cognitive restructuring, which has been shown to be effective in reducing anger and guilt (e.g., Resick, Nishith, Weaver, Astin, & Feurer, 2002).

A strength of this study is that the methodology was based on Foa and Meadows' (1997) gold standards for PTSD treatment studies (e.g., clearly defined target symptoms, use of blind evaluators, manualized treatments, unbiased assignment to treatment, and evaluation of treatment adherence; for details, see Taylor et al., 2003). A limitation is that trauma-related anger and guilt were each assessed by a single self-report item. Those items have the same format as the items in Foa's (1995) Posttraumatic Diagnostic Scale, which has established reliability and validity. Single-item scales typically have lower reliability than multi-item inventories; thus, future research is needed to determine whether the present findings can be replicated with other scales. Note, however, that the single-item measures of trauma-related anger and guilt produced the same pattern

of results as the multi-item, previously validated measures of trait anger and guilt. A further limitation of this study is that the sample size was modest and comprised participants who were primarily university-educated Caucasian females living in an urban setting. It remains to be seen whether the findings can be replicated with other samples, such as samples with more varied demographic profiles. Along with this criticism, larger studies are needed to have sufficient power to determine whether the treatments results are influenced by comorbid disorders.

The results of the present study suggest that trauma-related and trait anger and guilt need not be obstacles to PTSD treatment, and that the therapy techniques used in this study were effective in reducing these problematic emotions. Despite previously reported treatment impediments related to severe levels of these emotions, our results provide optimism in that different therapy techniques may be useful in reducing anger and guilt. It may be beneficial to further assess the extent to which other trauma-related emotions may affect the success of therapy. Another important research direction will be to examine the effects of PE, EMDR, relaxation training, and other PTSD treatments on trauma-related shame. Shame consists of cognitive and affective components, and includes beliefs in a negative global evaluation of the self as not being decent, good, or competent, combined with a sense of worthlessness or powerlessness (Street & Arias, 2001). A number of studies have linked shame to PTSD symptoms (e.g., Andrews, Brewin, Rose, & Kirk, 2000; Street & Arias, 2001), suggesting that shame plays an important role in the phenomenology of PTSD. Future studies could investigate how the treatments examined in the present study are able to reduce shame associated with traumatic experiences.

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