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# JOURNAL OF EMDR PRACTICE AND RESEARCH



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# Journal of EMDR Practice and Research

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# ARTICLES

## Eye Movement Desensitization and Reprocessing as an Adjunctive Treatment of Unipolar Depression: A Controlled Study

Arne Hofmann EMDR Institut Deutschland, Bergisch Gladbach, Germany

> Angelika Hilgers Private Practice, Krefeld, Germany

Maria Lehnung Private Practice, Eckernfoerde, Germany

**Peter Liebermann** Private Practice, Leverkusen, Germany

**Luca Ostacoli** San Luigi Gonzaga Hospital Medical School, University of Turin, Italy

> **Wolfgang Schneider** Rhineland Academy for Psychotherapy, Germany

**Michael Hase** Diana Hospital Bad Bevensen, Germany

Depression is a severe mental disorder that challenges mental health systems worldwide. About 30% of treated patients do not experience a full remission after treatment, and more than 75% of patients suffer from recurrent depressive episodes. Although psychotherapy and medication can improve remission rates, the success rates of current treatments are limited. In this nonrandomized controlled exploratory study, 21 patients with unipolar primary depression were treated with a mean of 44.5 sessions of Cognitive Behavioural Therapy (CBT) including an average 6.9 adjunctive sessions of Eye Movement Desensitization and Reprocessing (EMDR). A control group (n = 21) was treated with an average of 47.1 sessions of CBT sessions alone. The main outcome measure was the Beck Depression Inventory II (BDI-II). The treatment groups did not differ in their BDI-II scores before treatment, and both treatments resulted in significant improvement. There was an additional benefit for patients treated with adjunctive EMDR (p = .029). Also the number of remissions at posttreatment, as measured by a symptom level below a BDI-II score of 12, was significantly better in the adjunctive EMDR group, the group showing more remissions (n = 18) than the control group (n = 8; p < .001). This potential effect of EMDR in patients with primary depression should be examined further in larger randomized controlled studies.

**Keywords:** controlled study; depression; eye movement desensitization and reprocessing (EMDR); adaptive information processing (AIP) model; stressful life experiences

epression is a severe challenge to mental health systems worldwide, and this challenge is increasing. The World Health Organization has categorized depression as one of the most disabling diagnoses in the world, estimated to affect nearly 340 million people worldwide at any one time (Greden, 2001; Murray & Lopez, 1996). Although a significant number of patients affected by depression suffer from only a single depressive episode, much of the disease burden of depression is associated with the growing recognition of the chronic and recurrent nature of this disorder. It has been estimated that 75%–90% of patients with a depressive episode, depending on the length of observation period, will have more than one depressive episode (Angst, 1992; Keller, 2002; Kupfer, 1991; Maj et al., 1992). Interestingly, one of the major risk factors for a recurrence of the disorder is an incomplete remission of the last episode (Nierenberg, Petersen, & Alpert, 2003).

#### The Treatment of Depression

Although options for the treatment of depression have expanded significantly in the last 20 years, the early optimism accompanying new antidepressant medications such as selective serotonin reuptake inhibitors (SSRIs) has rapidly faded. In fact, a recent meta-analysis has concluded that antidepressants have only a modest advantage over placebo, with the magnitude of benefit increasing with the severity of the depression (Fournier et al., 2010). In addition, psychopharmacological intervention is hampered by side effects (e.g., weight gain) and nonadherence problems (Hirschfeld, 2003; Kripalani, Yao, & Haynes, 2007; Reid & Barbui, 2010).

In a randomized controlled trial (RCT; Sequenced Treatment Alternatives to Relieve Depression, STAR\*D), 3,671 patients with unipolar depression where treated with antidepressant drugs (citalopram 20–60 mg). The initial remission rate was 37%. Three additional levels of treatment (Level 2 being adjunctive cognitive behavioral therapy [CBT]) were offered based on response (Rush et al. 2006). The cumulative remission rate after four levels was 67% (remission defined the absence of depressive symptoms as measured in a standardized rating scale).

Psychotherapeutic interventions have a long tradition in the treatment of depression. A meta-analysis of 28 studies found that one of the major effective therapy approaches in the field, cognitive behavioral psychotherapy, reduced the relapse rate significantly in major depression compared to pharmacotherapy only. A qualitative review concluded that—among patients treated to remission—cognitive therapy reduces relapse recurrence by roughly 50% (Holon, Steward, & Strunk, 2006). However, relapse rates, even in patients who respond to psychotherapeutic treatment, were still high. In fact, 1 year after discontinuation of psychotherapy treatment for acute depression, the relapse rate was 29%, and this increased to 54% after 2 years (Vittengl, Clark, Dunn, & Jarrett, 2007).

#### Life Stressors and Depressive Episodes

Stress and its neurobiological correlates are significant factors in both the causation and development of depressive episodes; chronic and acute stressors, especially in childhood, are well-established contributors to the disease and can even trigger the onset of these disorders (Heim & Nemeroff, 2001; McFarlane, 2010; Nanni, Uher, & Danese, 2012). Earlier research showed that first episodes of depression are often more closely related to a specific psychosocial stressor than later episodes. In fact, later episodes of depression can be triggered by far smaller stressors or even without any noticeable stressor (Post, 1992).

The strong influence of stressful life events such as threat, loss, or humiliation on the development of depression is also evident in a recent meta-analysis of genetic studies conducted by Neil Risch and colleagues (2009). Interestingly, the only risk factor that correlated significantly with depressive episodes was the occurrence of stressful life events. The presence of a serotonin transporter gene polymorphism alone, even in combination with stressful life events, was not significantly correlated with the occurrence of depressive episodes in the same meta-analysis (Risch et al., 2009). These results concur with studies that show that traumatic life events seem to have both a close dose response and a time relationship with the occurrence of depressive episodes (Kendler, Hettema, Butera, Gardner, & Prescott, 2003; Teicher, Samson, Polcari, & Andersen, 2009; Wise, Zierler, Krieger, & Harlow, 2001). Looking at the evidence, it seems that depressive disorders may be more linked to the stress- and trauma-based disorders than is reflected in the current approaches to depression (Horwitz & Wakefield, 2007; Maj, 2012).

The hallmark disorder of trauma-based disorders (or the beta version of the International Classification of Diseases, 11th revision [ICD-11] is used, the disorders specifically related to stress) is posttraumatic stress disorder (PTSD). PTSD is a well-studied disorder, and treatment has improved significantly over the past 20 years. Studies of PTSD treatment approaches have shown that trauma-specific treatments improve PTSD symptoms significantly better than nonspecific psychotherapy (Bisson et al., 2007; Bisson, Roberts, Andrew, Cooper, & Lewis, 2013).

Interestingly, approximately 80% of PTSD patients also suffer from significant comorbidity, especially depression. This comorbid depression tends to improve significantly if the PTSD alone is treated first, without any specific treatment for the depression (Ho & Lee, 2012; van Etten & Taylor, 1998). Nevertheless, trauma-specific treatment methods that are able to successfully treat the stressful memories which cause PTSD are currently rarely studied for the treatment of primary depressive disorders (Grey, 2011).

#### EMDR

Eye movement desensitization and reprocessing (EMDR) is an eight-phase psychotherapy approach that was developed by Francine Shapiro (2001). A key component of EMDR is bilateral stimulation (with, e.g., eye movements), which is applied simultaneously while the patients are focusing on the memory which is the cause of the current symptoms. EMDR is one of the most efficient psychotherapy methods for the treatment of PTSD (Bisson et al., 2013). Some studies have suggested that EMDR may be more rapid than other effective treatments (e.g., van Etten & Taylor, 1998). EMDR treatment outcomes seem to be stable over time, according to a controlled 35-month follow-up study (Hoegberg et al., 2007).

EMDR is guided by an information processing model known as the adaptive information processing (AIP) model (Shapiro, 2001). One of the key assumptions of the AIP model is that dysfunctionally stored (disturbing) memories are the cause of several mental pathologies, including PTSD, other trauma-based disorders, as well as some depression and anxiety disorders. EMDR is currently used to address a range of complaints that follow distressing life experiences (Shapiro & Maxfield, 2002).

#### EMDR in the Treatment of Depressive Disorders

Although originally developed to alleviate the distress caused by traumatic memories, especially those associated with PTSD, EMDR was proposed early on for the treatment of other pathologies which are not necessarily linked with traumatic events that meet the A criterion of PTSD. In fact, EMDR was already being used by clinicians for the treatment of patients with depression in the early 1990s (Marquis, 1991). Systematic studies have demonstrated the effects of EMDR on PTSD-related depression. In a randomized clinical trial, van der Kolk and colleagues (2007) compared the effectiveness of fluoxetine treatment with EMDR and a placebo pill in a PTSD population. After the intervention, the EMDR-treated group had significantly lower BDI-II scores than the fluoxetine-treated group. This finding is echoed by a recent meta-analysis on the treatment of PTSD and comorbid depression: Ho and Lee (2012) showed that EMDR seemed to have a significantly stronger effect on the comorbid depression than CBT, although the effect on the PTSD was similar.

This drop in depressive symptoms, following EMDR treatment of memories which patients experience as traumatic, seems to not be limited to PTSD patients alone. In a controlled study, Wilson, Becker, & Tinker (1995) treated a group suffering from stress-ful memories. Although only 54% of these patients fulfilled the criteria of PTSD (including the A criterion that describes the event as traumatic), all of them benefited from EMDR treatment, as evidenced by significant improvements in their PTSD and depressive symptoms. Both benefits were maintained at a 15-month follow-up (Wilson et al., 1995, 1997).

The first case series of two adolescents with major depression who were treated with EMDR was published in 2008. Their successful treatment required three and seven sessions, respectively, and treatment results were stable at 3 months follow-up (Bae, Kim, & Park, 2008). In both cases, EMDR was used successfully in the treatment of events which were related to changed or lost relationships but did not fit into the Criterion A category of PTSD. Rather, they could be considered as stressful life events or "attachment trauma." In another case series with longitudinal single-subject design, three depressive patients were treated with EMDR. The treatment improved the depression significantly in all three cases and had a positive effect on both the emotional-cognitive processing and long-term memory conceptual organization (Uribe, Ramírez, & Mena, 2010).

Events such as these also seem to be a specific risk factor for the emergence of depressive disorders. In a large, retrospective study, losses and separation events as well as humiliating events were significantly linked to depressive episodes 1 month later (Kendler et al., 2003).

The observation that depressive symptoms seem to be more linked with non–Criterion A events is also evident in several case reports, where depressive patients were successfully treated with EMDR, with EMDR being either the only therapy administered or as adjunctive to other therapy approaches (Broad & Wheeler, 2006; Grey, 2011; Manfield, 1998; Shapiro, 2009; Shapiro & Silk Forrest, 1997; Sun, Wu, & Chiu, 2004; Tinker & Wilson, 1999).

Unfortunately, no controlled studies have been published using EMDR as an intervention for patients diagnosed with depression alone. Thus, the purpose of this controlled study was to begin filling this gap and to explore the potential of adjunctive EMDR in patients with primary depression.

#### Method

Because of the German insurance system, the usual psychotherapy treatments in Germany are limited to the application of three general psychotherapy orientations: psychodynamic psychotherapy, psychoanalytic psychotherapy, and CBT. Within these basic therapy orientations, certain additional psychotherapy methods are permitted. In 2006, the German scientific advisory board for psychotherapy recognized EMDR as a scientifically based psychotherapy method for the treatment of PTSD (Scientific Advisory Board [wissenschaftlicher Beirat] Psychotherapie, 2006). Thus, most psychotherapists in Germany that are trained in the use of EMDR integrate it into their usual psychotherapy treatment approach.

#### Study Procedure

All patients in this study suffered from a unipolar depressive episode and were treated at the outpatient clinic of the Rhineland Academy for Psychotherapy (RHAP), a CBT psychotherapy training center in Krefeld (Germany). The standard treatment for depression at the clinic is CBT. Medication is given in separate sessions by an independent psychiatrist if needed. Between 2008 and 2012, some therapists in their last formal year of training for CBT therapy at the RHAP also received an EMDR basic training and ongoing EMDR supervision.

Patients who suffered from unipolar depression and who were assigned by chance to these EMDRtrained therapists were offered the opportunity to become part of this research study. We recruited a group of 30 patients who agreed after informed consent to be treated with adjunctive EMDR sessions included in their usual CBT treatment (treatment as usual [TAU] + EMDR).

From the beginning of the study, for every patient who started EMDR treatment, a TAU patient was randomly selected from the patients of the same clinic who fulfilled inclusion/exclusion criteria and had received CBT treatment. The TAU therapists completed their CBT training during the same time period at the institute as the EMDR therapists, but they did not receive EMDR training.

#### Participants

TAU + EMDR Participants. Inclusion criteria for the TAU + EMDR participants were the ability to do psychotherapy and the willingness to participate in EMDR sessions that worked with the stressful memories considered to be related to the depressive episode(s). Exclusion criteria were comorbidity with other severe psychological disorders, psychotic disorders, or PTSD. Exclusion criteria were also significant cognitive impairment, severe somatic illness that required interventions, and pending legal processes. Because of the exploratory character of the study, six patients were accepted in the study group even though they fulfilled the criteria of an additional disorder. In the control group, two patients with a comorbid diagnosis were accepted. The comorbidities in the TAU + EMDR group were panic disorder (two), social phobia, borderline personality disorder (two), and a not specified eating disorder. The comorbidities in the TAU group were cannabis abuse and alcohol abuse each in one case.

The initial TAU + EMDR sample consisted of 45 outpatients of the psychotherapy clinic of the RHAP who had a diagnosis of unipolar depression and had been assigned to a therapist from the group trained in EMDR. Of these patients, 15 were excluded from the study because 10 did not fulfill inclusion criteria and 5 declined to participate. The selected group of 30 patients was followed through treatment, and 21 patients received the full adjunctive treatment and their scores were analyzed. Of the 9 patients who did not receive the full adjunctive treatment, 1 patient declined further EMDR sessions, the other 8 did not receive the full treatment for other reasons. Three of them were patients with a comorbid disorder: unspecified eating disorder, social phobia, and 1 of the patients with borderline disorder. Eight of the 9 dropouts of the EMDR treatment did complete their TAU treatment; 1 did not complete his TAU treatment.

*TAU Participants.* Exclusion criteria for the TAU participants were the same as that of the TAU + EMDR participants (comorbidity with other severe psychological disorders, psychotic disorders, or PTSD as well as significant cognitive impairment, severe somatic illness that required interventions, and pending legal processes). Inclusion criterion was the successful completion of the TAU program and the inclusion criteria of the study (a diagnosis of unipolar depression and the ability to do psychotherapy).

The TAU patients had been treated by other therapists of the clinic not trained in EMDR. To match the 21 completers of the TAU + EMDR group, the data of 21 patients who had completed TAU were randomly selected for this TAU control group for the final analysis.

#### Treatment

The end point of TAU and EMDR as well as of TAU treatment was determined by the therapist (and the consulting case supervisors) together with the patient by clinical criteria alone. The number of EMDR sessions which were considered a minimum for an "adjunctive EMDR therapy" in this study was three.

*Therapists.* All therapists in the study were psychotherapy candidates in advanced CBT training. The 14 EMDR therapists completed an EMDR International Association (EMDRIA)–approved EMDR training prior to the study. Because a single candidate can only have a limited number of patients during their training, each candidate had only one to a maximum of four patients they could treat in the study.

**Treatment Fidelity.** All therapists in the TAU + EMDR group and the TAU group had regular CBT supervision to control for the fidelity of their CBT treatments. This supervision was conducted after every fourth therapy session. The therapists of the TAU + EMDR group had additional regular supervision by an experienced EMDR trainer to assure the fidelity of the EMDR treatment according to the standards of EMDR Europe.

*CBT Treatment.* The CBT treatment followed the manuals of cognitive therapy for depression (Beck, Rush, Shaw, & Emery, 1979; Hautzinger, 2003). The therapy works systematically with dysfunctional beliefs and teaches self-monitoring of negative affect and its influence on feelings and behavior. In addition, patients are taught decision making and how to increase the frequency and quality of pleasant experiences. All CBT treatment in our study was done in individual one-on-one sessions. Homework assignments support the patients to improve abilities such as their social skills in their everyday life.

*EMDR Treatment.* The EMDR treatment followed the eight-phase outline of EMDR described by Shapiro (2001). EMDR targets were selected following the AIP model that looks for stressful events linked with the depression. Depending on the specific needs of the patients, the EMDR focus was to process either traumatic (Criterion A) or nontraumatic (not fulfilling Criterion A) events which had a time relationship with the current depressive episode or were possibly connected with it ("episode triggers"). During previous studies, a systematic approach has been

developed, has recently been published, and is part of a current RCT study (Hofmann et al., 2014).

#### Measurements

The diagnosis of depression was made by an initial diagnostic interview using the Structured Clinical Interview for DSM-IV Axis-I Disorders (Wittchen, Zaudig, & Wunderlich, 1997). The interview was not done blinded but was conducted by the therapist who later treated the patient. The main outcome of the study was the level of depressive symptoms as measured by the Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996; Hautzinger, Keller, & Kühner, 2006). The BDI-II is a 21-item self-report measure with good psychometric properties. It has a high sensitivity to changes during therapy, which was what our study was looking for. Scores range from 0 to 63, with the following cutoffs: 0-13 minimal range, 14-19 mild depression, 20-28 moderate depression, and 29-63 severe depression. The test was administered at pre- and posttreatment.

#### Data Analysis

We recorded BDI-II scores before (BDIpre) and after (BDIpost) treatment. Data analysis was done by repeated measures analysis of variance (ANOVA) with treatment (CBT vs. CBT + EMDR) as between group factor and time (BDIpre vs. BDIpost) as within-subjects factor. The conventional alpha level of 5% (two-tailed) was used. Planned posthoc *t* tests were conducted to further examine the differences between scores at pretreatment and at posttreatment within and between groups.

Also, we recorded remission of depression (remission of episode vs. no remission), taking a BDIpost score of 12 as cutoff. Because these data did not meet criteria for parametric analysis, we used non-parametric Mann–Whitney *U* test for independent samples,  $\alpha = .05$ . Data were analyzed with IBM SPSS Statistics 22.

#### Results

The mean age of all 42 (21 + 21) patients was 40.38 years (SD = 10.38). Mean age of the TAU group was 40.67 years (SD = 12.145); mean age of the TAU + EMDR group was 40.1 years (SD = 9.859). The age differences between the two treatment conditions were not statistically significant at  $\alpha = .05$ . Also, sex differences between the two groups did not differ significantly. Of the 21 patients, 11 in the TAU + EMDR group and 15 of the 21 patients in the TAU group suffered from recurrent depressive episodes.

#### **TABLE 1.** Sample Characteristics

	TAU + EMDR group ( $n = 21$ )	TAU group $(n = 21)$	Statistics
Age (years)	40.1 ( <i>SD</i> 9.67)	40.67 ( <i>SD</i> 12.145)	t =125  (df  28)
			p = .903 (ns)
Male/female	4/17	5/16	U =372
			p = .710 (ns)
Severity of episode	1/18/2	0/21/0	$\chi^{2} = .350$
F3X.0/3X.1/3X.2			p = .573 (ns)
Recurrent depression (F33.x)	11	15	$\chi^2 = .000$
			p = 1.000 (ns)

Note. TAU = treatment as usual; EMDR = eye movement desensitization and reprocessing.

The two groups did not differ with respect to severity of depression (F3x.1/F3x.2) nor in respect to chronicity (F32.x/F33.x). Results of statistical analysis of participant parameters are shown in Table 1.

The TAU + EMDR patients received on average 6.9 sessions of EMDR (range: 3–16 sessions) and completed an average of 37.58 treatment sessions of CBT, for a mean total of 44.48 therapy sessions (SD = 11.48). The TAU group received a mean of 47.11 therapy sessions (SD = 7.41). A *t* test for independent samples did not reveal a statistically significant difference between the number of mean sessions (t[28] = -.631, p = .533).

#### Analysis of Treatment Effects

Data analysis by repeated measures ANOVA revealed a significant interaction effect. A comparison between the scores of both treatment groups showed a significant interaction of treatment with time for depression scores, showing a significant difference between the effects of the two treatments (F[1,40] = 5,108, p = .029), indicating that patients within the TAU + EMDR group showed a different pattern of change compared to the TAU group. Posthoc tests were done to further evaluate these differences. See Figure 1.

A posthoc *t* test was conducted to compare BDI-II scores at pretreatment. Results showed no significant differences of pretreatment scores (t[40] = .149, p = .882), indicating that the TAU + EMDR and TAU participants did not differ in the severity of BDI-II scores at pretreatment. See Table 2 and Figure 1. Posthoc *t* tests were conducted to determine if the two treatments had produced a significant decrease in BDI-II scores. Results showed significant differences for both the TAU + EMDR group (t[20] = 6.604, p = .000) and the TAU group (t[20] = 6.886, p = .000), indicating that both treatments were effective in reducing symptoms of depression.

A *t* test was conducted to compare BDI-II scores at posttreatment. Results showed that posttreatment scores differed significantly (t[40] = -2.675; p = .011), indicating that the TAU + EMDR participants improved significantly more on depression as indexed by the BDI than the TAU patients treated with CBT alone.

Comparison of remissions, as defined by a BDI-II score of 12 or below, differed over the categories of treatment as shown by the Mann–Whitney *U* test (U = 105,000; p < .001), the TAU + EMDR group showing significantly more remissions (n = 18) than the TAU group (n = 8). See Table 2.

*Medication.* Six of the patients in the TAU group received antidepressant medication at the beginning of psychotherapy versus nine patients in the TAU + EMDR group. Chi-squared tests did not reveal a significant difference. During the study, four changes of medication were recommended by the psychiatrist in the TAU + EMDR group and six in the TAU group.



**FIGURE 1.** BDI-II scores under treatment conditions. BDIpre = Beck Depression Inventory pretreatment score; BDIpost = Beck Depression Inventory posttreatment score; TAU = treatment as usual; EMDR = eye movement desensitization and reprocessing.

#### TABLE 2. Results

	TAU + EMDR group $(n = 21)$	TAU group $(n = 21)$
BDI-II score at pretreatment	23.57 (SD 7.639)	23.19 (SD 8.892)
BDI-II score at posttreatment	7.86 (SD 5.452)	14.24 ( <i>SD</i> 9.476)
Number of remissions	18	8

*Note.* Remission is defined as a Beck Depression Inventory II (BDI-II) score of 12 or more at posttreatment. TAU = treatment as usual; EMDR = eye movement desensitization and reprocessing.

All of the changes in the TAU group were first time prescriptions of antidepressant medication; one first time prescription of an antidepressant was observed in the TAU + EMDR group. Types of antidepressant medication and their distribution at the beginning of psychotherapy are given in Table 3.

#### Discussion

This exploratory study aimed at determining the clinical effectiveness of adjunctive EMDR sessions in patients affected by unipolar depression without PTSD. It included two groups of 21 patients each (N = 42) who were well-matched for age, gender, and chronicity of their depression. Both groups were treated with an average of 45.7 sessions of CBT. One group was treated with 6.9 additional sessions of adjunctive EMDR (range 3–16) within the frame of the 45.7 sessions. The other group was treated with a similar number of CBT sessions alone.

As a main result, the study revealed a significant difference in the decrease of the BDI-II scores after treatment, showing that the patients benefited from CBT and from CBT with adjunctive EMDR treatment. Results also showed a larger decrease in BDI-II scores for TAU + EMDR compared to CBT treatment alone (p = .011). Although CBT has been a highly effective and well-established treatment for

TABLE 3. Types of Antidepressant Medication

	SSRI	NASSRI	Other	None
TAU + EMDR	5	0	4	12
TAU	1	1	4	15

*Note.* SSRI = selective serotonin reuptake inhibitor; NASSRI = noradrenergic and specific serotoninergic antidepressants; TAU = treatment as usual; EMDR = eye movement desensitization and reprocessing. depression for many years, adjunctive EMDR sessions may improve the beneficiary effect of the treatment in depression.

Further analysis of our groups showed that the number of remissions of the depression (as measured by a symptom level of a BDI-II score of 12 or below) demonstrated a highly significant difference that showed the additional benefits for the group which had received adjunctive EMDR (p < .001). Considering that many patients fail to respond to appropriate treatment with antidepressant medication and/or psychotherapy and more than 30% do not achieve full remission after any type of current treatment, the results of adjunctive EMDR observed in this study are worth reporting and should be more deeply investigated in larger controlled studies. Also, because the patients who do not reach full remission after treatment have a higher risk to relapse, adjunctive EMDR could possibly evolve as an additional tool for relapse prevention for depression (Nierenberg et al., 2003).

As the first controlled study using EMDR in the treatment of primary depression, it is noteworthy that a limited number of an average of 6-7 EMDR sessions within the frame of 45.7 psychotherapy sessions seems to make a significant difference on the symptom level for the patients. One of the explanations of this result may be that significant stressful events may not only contribute to triggering a depressive episode but the memories of such events also could contribute to maintaining the depression. So the processing of the dysfunctionally stored memories of such stressful events with EMDR in patients with primary depression may have contributed to the significant symptom improvement in the EMDR group. This may also have contributed to the significantly higher number of remissions in the patients of this group. Also, the study could be seen as an encouragement that depressive patients, who often need several therapeutic interventions, can benefit if EMDR is integrated as an adjunctive therapy with the other therapy approaches used in their treatment.

Our study could also be seen as a confirmation of Bae and his collaborators (2008) for the selection of the memories they targeted with EMDR in their two cases of adolescent depression. In both cases, they did not target Criterion A events but significant attachment trauma events. In our study, these "attachment events" were the events which the therapists focused on during most of their EMDR sessions. Of the 21 patients who received EMDR in our study group, only 5 had reported Criterion A events which were then processed with EMDR (3 traffic accidents, 1 rape, and 1 case of domestic violence). The other patients reported stressful memories that did not fulfill the A criterion of PTSD but were also processed with EMDR. Most of these memories described relationship events that were still stressful to the patients. One was a diagnosis of a cancer relapse. Many of these events were losses, separations, or humiliating events—the very type of memories that according to the study of Kendler and colleagues (2003) are connected to the occurrence of depressive episodes.

In the EMDR model of AIP, it has been postulated that stressful life events must not only include life-threatening events (Criterion A) to become "dysfunctionally stored in memory networks" and cause present pathology. Typically, for such dysfunctional memories, the past event is still experienced as stressful by the patient in the present. This fits well with a study that shows that victims of stressful life events do not describe Criterion A events as being "more traumatic" than other stressful life events (Gold, Marx, Soler-Baillo, & Sloan, 2005).

Because EMDR is often seen as a method to treat PTSD only, this is understood as a limitation that the events which should be targeted with EMDR should be Criterion A events. At least in the case of depression, this seems not to be the case. Because attachment trauma such as losses, separations, and humiliations seem to be more connected with the development of a depressive episode than Criterion A events (Kendler et al., 2003), the processing of such memories with EMDR seems to improve the symptoms of the depressive episode.

Following these studies and the results of our study with depressive patients, it may well be that in the case of depression, it is not so important that a memory (which needs to be processed) is "traumatic" (in the sense of Criterion A of PTSD) but rather that it is still dysfunctionally stored in the sense of the AIP model and continues to produce a certain psychobiological pathology (such as creating intrusions or a subjective feeling of distress while remembering). However, this can only be tested in further systematic studies.

Limitations of this study that limit the generalizability of the results are methodological limitations such as the lack of randomization, the low number of patients, the lack of independent assessment, and the use of a self-reporting instrument as outcome. Another limitation was that for our study, we selected a control group of CBT completers from the same clinic at the same time but not a group that was randomized and followed though treatment. The fact that this study is a study of treatment completers that may have lost some more complex depression cases before

analysis may lead to an overestimation of the effects of EMDR. Of the 30 TAU + EMDR patients, 9 did not complete EMDR treatment and were lost to analysis. Three of these patients were 3 of the 6 patients with serious comorbidity (a patient with social phobia, 1 with a not specified eating disorder, and 1 of the 2 borderline patients of the study). The 1 patient who had declined further EMDR sessions described an increase of stress during the EMDR session which had demotivated him from further EMDR session (this was not one of the cases with comorbidity). In both groups of our study also, the limited clinical experience of our study therapists may have played a role and limited the generalizability of the study. On the other side, the possible potential of adjunctive EMDR may be seen in the case of the 2 borderline patients of our study. Both received 45 sessions of psychotherapy. Although 1 of them received only 2 sessions of EMDR and showed no improvement at the end of the study, the other received 13 sessions of EMDR and ended therapy with significant improvement and a BDI-II score of 10.

The last limitation is currently the lack of data on the follow-up of the patients. This is one of the organizational limitations of our study which hopefully can be remedied by a multicenter controlled trial on EMDR in patients with depression who has already begun and will have a follow-up.

Despite the limitations of this study, this first controlled study that used EMDR with depressive patients can, in our opinion, encourage further studies in this field. It may be that a method such as EMDR that processes stressful memories can add to the therapeutic options in these patients and help more depressive patients to reach full remission from their depressive episodes.

#### Implications for Future Research

Future research using EMDR for the treatment of depressive patients should focus on randomized controlled studies. It could study the integration of EMDR with other treatments and compare it with EMDRonly interventions for different subgroups of depressive disorders.

Research could evaluate which types of patients with depressive disorders would benefit most from EMDR therapy. Given the connection between partial remissions and recurrent episodes, it is possible that the patients with depressive disorders who might benefit most from future EMDR studies could be patients with recurrent depressions. Considering the possible connection of the maintenance of depressive symptoms and dysfunctionally stored memories and the ability of EMDR to process these, some groups of chronic depressive patients could also benefit from future EMDR studies. Also, research investigating the value of adjunctive EMDR for children and adolescents at the beginning of their "depressive careers" could be helpful. Research could also evaluate if EMDR provides a greater benefit for those children and adolescents with depression who have experienced traumatic events or losses. Also, a comparative, cost-effectiveness study could assess the potential benefit of the interventions on limited medical resources.

#### References

- Angst, J. (1992). How recurrent and predictable is depressive illness. In S. Montgommery & F. Roullon (Eds.), *Long-term treatment of depression: Perspectives in psychiatry* (Vol. 3, pp. 1–13). Chichester, United Kingdom: Wiley.
- Bae, H., Kim, D., & Park, J. C. (2008). Eye movement desensitization and reprocessing for adolescent depression. *Psychiatry Investigation*, 5, 60–65.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York, NY: Guilford.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck Depression Inventory-II (BDI-II). San Antonio, TX: Harcourt Assessment.
- Bisson, J. I., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder. Systematic review and meta-analysis. *British Journal of Psychiatry*, 190, 97–104.
- Bisson, J. I., Roberts, N. P., Andrew, M., Cooper, R., & Lewis, C. (2013). Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database of Systematic Reviews*, (12), CD003388.
- Broad, R. D., & Wheeler, K. (2006). An adult with childhood medical trauma treated with psychoanalytic psychotherapy and EMDR: A case study. *Perspectives in Psychiatric Care*, 42, 95–105.
- Fournier, J. C., DeRubeis, R. J., Hollon, S. D., Dimidjian, S., Amsterdam, J. D., Shelton, R. C., & Fawcett, J. (2010).
  Antidepressant drug effects and depression severity: A patient-level meta-analysis. *Journal of the American Medical Association*, 303(1), 47–53.
- Gold, S. D., Marx, B. P., Soler-Baillo, J. M., & Sloan, D. M. (2005). Is life stress more traumatic than traumatic stress? *Journal of Anxiety Disorders*, 19, 687–698.
- Greden, J. F. (2001). The burden of recurrent depression: Causes, consequences, and future prospects. *Journal of Clinical Psychiatry*, 62(Suppl. 22), 5–9.
- Grey, E. (2011). A pilot study of concentrated EMDR: A brief report. *Journal of EMDR Practice and Research*, *5*, 14–24.
- Hautzinger, M. (2003). Kognitive Verhaltenstherapie bei Depressionen. Weinheim, Germany: Beltz.

- Hautzinger, M., Keller, F., & Kühner, C. (2006). Beck Depressionsinventar (BDI-II) Revision. Frankfurt, Germany: Harcourt Test Services.
- Heim, C., & Nemeroff, C. B. (2001). The role of childhood trauma in the neurobiology of mood and anxiety disorders: Preclinical and clinical studies. *Biological Psychiatry*, 49, 1023–1039.
- Hirschfeld, R. M. (2003). Long-term side effects of SSRIs: Sexual dysfunction and weight gain. *Journal of Clinical Psychiatry*, 64(Suppl. 18), 20–24.
- Ho, M. S. K., & Lee, C. W. (2012). Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder—Is it all in the homework then? *Revue européenne de psychologie appliquée*, 62, 253–260.
- Hoegberg, G., Pagani, M., Sundin, O., Soares, J., Aeberg-Wistedt, A., Tarnell, B., & Haellstroem, T. (2007).
  On treatment with eye movement desensitization and reprocessing of chronic post-traumatic stress disorder in public transportation workers—A randomized controlled trial. *Nordic Journal of Psychiatry*, 61, 54–61.
- Hofmann, A., Hase, M., Liebermann, P., Lehnung, M., Ebner, F., Rost, C., & Tumani, V. (2014). An EMDR protocol for the treatment of depression. In Luber M. (Ed.), *EMDR Scripted Protocols*. New York, NY: Springer Publishing.
- Holon, S. D., Steward, M. D., & Strunk, D. (2006). Enduring effects for cognitive behavior therapy in the treatment of depression and anxiety. *Annual Review of Psychology*, 57, 285–315.
- Horwitz, A. V., & Wakefield, J. C. (2007). The loss of sadness: How psychiatry transformed normal sorrow into depressive disorder. Oxford, United Kingdom: Oxford University Press.
- Keller, M. B. (2002). Rationale and options for the longterm treatment of depression. *Human Psychopharmacol*ogy: Clinical and Experimental, 17(Suppl. 1), S43–S46.
- Kendler, K. S., Hettema, J. M., Butera, F., Gardner, C. O., & Prescott, C. A. (2003). Life event dimensions of loss, humiliation, entrapment, and danger in the prediction of onsets of major depression and generalized anxiety. *Arch Gen Psychiatry*, 60(8), 789–796.
- Kripalani, S., Yao, X., & Haynes, R. B. (2007). Interventions to enhance medication adherence in chronic medical conditions: A systematic review. *Archive of Internal Medicine*, 167, 540–550.
- Kupfer, D. J. (1991). Long-term treatment of depression. *Journal of Clinical Psychiatry*, 52(Suppl.), 28–34.
- Maj, M. (2012). Development and validation of the current concept of major depression. *Psychopathology*, *45*, 135–146.
- Maj, M., Veltro, F., Pirozzi, R., Lobaece, S., & Magliano, L. (1992). Pattern of recurrence of illness after recovery from an episode of major depression: A prospective study. *American Journal of Psychiatry*, 149, 795–800.
- Manfield, P. (Ed.). (1998). Extending EMDR: A casebook of innovative applications. New York, NY: Norton.
- Marquis, J. N. (1991). A report on seventy eight cases treated by eye movement desensitization. *Journal of Behaviour Therapy and Experimental Psychiatry*, *22*, 187–192.

- McFarlane, A. C. (2010). The long-term costs of traumatic stress: Intertwined physical and psychological consequences. *World Psychiatry*, *9*, 3–10.
- Murray, C. J., & Lopez, A. D. (1996). The global burden of disease: A comprehensive assessment of mortality and disability from disease, injuries, and risk factors in 1990 and projected to 2020. Cambridge, MA: Harvard University Press.
- Nanni, V., Uher, R., & Danese, A. (2012). Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: A meta-analysis. *American Journal of Psychiatry*, 169, 141–151.
- Nierenberg, A. A., Petersen, T. J., & Alpert, J. E. (2003). Prevention of relapse and recurrence in depression: The role of long-term pharmacotherapy and psychotherapy. *Journal of Clinical Psychiatry*, 64, 13–17.
- Post, R. M. (1992). Transduction of psychosocial stress into the neurobiology of recurrent affective disorder. *American Journal of Psychiatry*, 149, 999–1010.
- Reid, S., & Barbui, C. (2010). Long term treatment of depression with selective serotonin reuptake inhibitors and newer antidepressants. *British Medical Journal*, 340, 752–756.
- Risch, N., Herrell, R., Lehner, T., Liang, K. Y., Eaves, L., Hoh, J., . . . Merikanagas, K. R. (2009). Interaction between the serotonin transporter gene (5-HTTLPR), stressful life events, and risk of depression: A meta-analysis. *Journal of the American Medical Association, 301*, 2462–2471.
- Rush, A. J., Trivedi, M. H., Wisniewski, S. R., Nierenberg, A. A., Stewart, J. W., Warden, D., ... Fava, M. (2006). Acute and longer-term outcomes in depressed outpatients requiring one or several treatment steps: A STAR\*D report. *American Journal of Psychiatry*, *163*, 1905–1917.
- Scientific Advisory Board (wissenschaftlicher Beirat) Psychotherapie. (2006). Assessment for the scientific recognition of the EMDR method for the treatment of posttraumatic stress disorder. Retrieved from http://www.wbpsycho therapie.de
- Shapiro, F. (2001). *EMDR basic principles and protocols*. New York, NY: Norton.
- Shapiro, F., & Maxfield, L. (2002). Eye Movement Desensitization and Reprocessing (EMDR): Information processing in the treatment of trauma. *Journal of Clinical Psychology*, 58, 933–946.
- Shapiro, F., & Silk-Forrest M. (1997). EMDR, the breakthrough therapy for overcoming anxiety, stress, and trauma. New York, NY: Basic Books.
- Shapiro, R. (Ed.). (2009). EMDR solutions 2. New York, NY: Norton.
- Sun, T. F., Wu, C. K., & Chiu, N. M. (2004). Mindfulness meditation training combined with eye movement

desensitization and reprocessing in psychotherapy of an elderly patient. *Chang Gung Medical Journal*, *27*, 464–469.

- Teicher, M. H., Samson, J. A., Polcari, A., & Andersen, S. L. (2009). Length of time between onset of childhood sexual abuse and emergence of depression in a young adult sample: A retrospective clinical report. *Journal of Clinical Psychiatry*, 70, 684–691.
- Tinker, R. H., & Wilson, S. A. (1999). *Through the eyes of a child—EMDR with children*. New York, NY: Norton.
- Uribe, M. E. R., Ramírez, E. O. L., & Mena, I. J. (2010). Effect of the EMDR psychotherapeutic approach on emotional cognitive processing in patients with depression. *The Spanish Journal of Psychology*, 13, 396–405.
- van der Kolk, B. A., Spinazzola, J., Blaustein, M. E., Hopper, J. W., Hopper, E. K., Korn, D. L., & Simpson, W. B. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: Treatment effects and long-term maintenance. *Journal of Clinical Psychiatry*, 68, 37–46.
- van Etten, M. L., & Taylor J. (1998). Comparative efficacy of treatments for post-traumatic stress disorder: A meta-analysis. *Clinical and Psychological Psychotherapy*, *5*, 126–144.
- Vittengl, J. R., Clark, L. A., Dunn, T. W., & Jarrett, R. B. (2007). Reducing relapse and recurrence in unipolar depression: A comparative meta-analysis of cognitive-behavioral therapy's effects. *Journal of Consulting and Clinical Psychology*, *75*, 475–488.
- Wilson, S. A., Becker, L. A., & Tinker, R. H. (1995). Eye movement desensitization and reprocessing (EMDR) treatment for psychologically traumatized individuals. *Journal of Consulting and Clinical Psychology*, *63*, 928–937.
- Wilson, S. A., Becker, L. A., & Tinker, R. A. (1997). Fifteenmonth follow-up of eye movement desensitization and reprocessing (EMDR) treatment for posttraumatic stress disorder and psychological trauma. *Journal of Consulting* and Clinical Psychology, 65, 1047–1056.
- Wise, L. A., Zierler, S., Krieger, N., & Harlow, B. L., (2001). Adult onset of major depressive disorder in relation to early life violent victimisation: A case-control study. *Lancet*, 358, 881–887.
- Wittchen, H. U., Zaudig, M., & Wunderlich, U. (1997). SKID-I, klinisches Interview für DSM Achse 1: Psychische Störungen. Göttigen, Germany: Hogrefe.

Correspondence regarding this article should be directed to Dr. Arne Hofmann, EMDR Institute Germany, Dolmanstrasse 86b, 51427 Bergisch Gladbach. E-mail: Arne-Hofmann@t-online.de

## The Effects of Bilateral Eye Movements on EEG Coherence When Recalling a Pleasant Memory

Brandon Keller Larry Stevens Colleen Lui James Murray Matthew Yaggie Northern Arizona University

In an investigation of the interhemispheric coherence (IhC) model for eye movement desensitization and reprocessing (EMDR) bilateral eye movement (BEM) effects, 30 participants were exposed to a stationary dot, a blinking red/green dot, or saccadic BEMs during the contemplation of a positive emotional memory. Electroencephalographies (EEGs) were measured afterward during an eyes-closed processing stage. Analyses revealed no significant IhC enhancement for the BEM condition but significant increases in Delta and Low Beta EEG intrahemispheric BEM coherence in the right and left frontal areas, respectively, and a trend increase in Right Frontal Low Beta BEM coherence. LORETA neuroimaging was employed to visually present significant amplitude changes corresponding to observed coherence effects. The functional significance of these intrahemispheric coherence effects is presented and a cortical coherence extension of the IhC model is suggested.

Keywords: EMDR; bilateral eye movements; EEG; coherence; episodic memory; PTSD

ye movement desensitization and reprocessing (EMDR) has been recognized as an effective and efficient therapeutic approach for the treatment of effects of traumatic memories (American Psychiatric Association, 2004; Bisson et al., 2007; Cukor, Olden, Lee, & Difede, 2010; Lamprecht et al., 2004). These positive endorsements notwithstanding, empirical comparisons of EMDR with other popular trauma treatments such as prolonged exposure, stress inoculation training, cognitive behavior therapy, and relaxation therapy have been overall equivocal. Some studies have shown EMDR to be more effective, others have shown it to be less effective, and others have shown it to be equivalent (e.g., Davidson & Parker, 2001; Devilly & Spence, 1999; Ironson, Freund, Stauss, & Williams, 2002; Lee, Gavriel, Drummond, Richards, & Greenwald, 2002; Power et al., 2002; Rothbaum, Astin, & Marsteller, 2005; Taylor et al., 2003). Nevertheless, EMDR remains one of the more popular treatments for posttraumatic stress disorder (PTSD; Pagani, Hogberg, Fernandez, & Siracusano,

2013). Perhaps a better understanding of the components of this therapeutic intervention would lead to subtle refinements in the protocol which would produce even better outcomes and improved assistance to trauma victims.

A core component of EMDR that distinguishes it from other trauma treatment strategies is the use of bilateral stimulation during the contemplation of traumatic target events (Shapiro, 1989; Shapiro & Maxfield, 2002; Solomon & Shapiro, 2008). Following Shapiro's adaptive information processing (AIP) model (Shapiro, 2001; Solomon & Shapiro, 2008), this bilateral stimulation is posited to activate more remote neural networks to allow the linking of dissociated information with the target traumatic events, thus facilitating the reprocessing of these events and their eventual desensitization. Originally, Shapiro (1989) used bilateral visual stimulation through the movement of fingers laterally across the visual field at a rate of approximately two saccadic eye movements per second. However, over the years since her

discovery of the contributions of this component to traumatic memory reprocessing, bilateral auditory and kinesthetic stimulation has been used as well with equivalent anecdotal effects (Harper, 2012).

Although many theories have now been offered to explain the contributions of bilateral stimulation to the processing and depotentiation of traumatic memories (Bergmann, 2008), the mechanisms of action of this component have to date not been conclusively explicated. One of the more neurobiological models for the effects of bilateral stimulation on PTSD, the amygdala-anterior cingulate (ACC)/prefrontal cortical (PFC) coupling model, has to do with a growing body of evidence for (a) an overactivation of amygdaloid processes involved in the affective experiencing of traumatic events, combined with (b) a deactivation or decoupling of ACC and medial PFC functions that would otherwise permit a cognitive processing and depotentiation of such events in PTSD (Francati, Vermetten, & Bremner, 2007). In an even more reductionistic analysis, this model of PTSD symptomatology further hypothesizes that traumatic memories are locked into reverberating synaptic networks of overpotentiated alpha-amino-3-hydroxy-5-methyl-4-isoxazole (AMPA) receptors within the amygdala (Harper, Rasolkhani-Kaophorn, & Drozd, 2009). (c) This state of pathological processing of trauma is essentially reordered by bilateral sensory stimulation during the reexperiencing of the event by providing the low frequency tetanic stimulation necessary to depotentiate these AMPA receptors and subsequently, the retained amygdaloid memories. (d) Such a depotentiation of locked neural networks then allows these affective memories to spread into AC and PFC regions where they may be more naturally and cognitively reprocessed. Components of this model have received some support from animal and human neuroimaging studies (for a thorough review of this literature, see Pagani et al., 2013).

Shapiro (1989) had early suggested that saccadic bilateral visual stimulation in EMDR may recruit neural networks from opposite sides of the brain and allow heretofore dissociated networks to become linked to targeted traumatic events toward their eventual reprocessing. Initially proposed by Servan-Schreiber (2000) and empirically elaborated by Christman and colleagues (Christman, Garvey, Propper, & Phaneuf, 2003; Christman, Propper, & Brown, 2006; Christman, Propper, & Dion, 2004; Propper & Christman, 2008), this interhemispheric connectivity hypothesis for the effects of bilateral stimulation on episodic memory retrieval has received considerable investigation. If this hypothesis is correct, then two outcomes should occur: (a) Memory retrieval should improve during or immediately following bilateral stimulation and (b) measures of interhemispheric connection should show an increase following bilateral stimulation. These two predictions have received some empirical support from research to date.

For example, Christman et al. (2003) found enhanced word recognition and autobiographical memory retrieval following a 30-second engagement in horizontal saccadic eye movements. These outcomes have been supported by earlier studies of handedness (as a representation of interhemispheric interaction) and the effects of a sequential presentation of bilateral visual input on episodic memory (Christman & Propper, 2001). Additional research showing enhanced behavioral measures of interhemispheric interaction and creativity following bilateral eye movements (BEMs; Shobe, Ross, & Fleck, 2009), improved memory and accuracy for a visual event narrative after BEMs (Parker, Buckley, & Dagnall, 2009), enhanced memory retrieval (Christman et al., 2003; Lyle, Logan, & Roediger, 2008), impaired episodic memory following commissurotomy (Cronin-Golomb, Gabrieli, & Keane, 1996), and other studies (see Propper & Christman, 2008, for a comprehensive review of this literature) strongly support the enhancement of episodic-like memory retrieval following the presentation of bilateral saccadic eye movements.

The research literature has been more sparse and equivocal, however, for the effects of bilateral stimulation on direct measures of interhemispheric connectivity. One such measure of functional connectivity is electroencephalography (EEG) interhemispheric coherence (IhC). EEG coherence is a quantitative measure of EEG waveform or phase consistency between two disparate sites on the scalp (Nunez et al., 1997). Mathematically, coherence values represent the EEG waveform cross-spectral density function normalized by the power spectra and are represented by a squared correlation function having a magnitude between 0 and +/-1. Thus, coherence may be interpreted as the functional communication or connectivity between two recording sites, with higher coherence representing higher cooperation and synchronization between measured brain regions in a specified frequency (Knott, LaBelle, Jones, & Mahoney, 2002; Nunez et al., 1997; Weiss & Mueller, 2003). Bergmann (2008) asserts that synchronized neuronal oscillations as indexed broadly by cortical EEG coherence are the basis of human perception and functioning. If the selected recording sites are homologous sites on opposite sides of the cortex



**FIGURE 1.** Schematic of international 10–20 system for EEG electrode placement.

(e.g., electrodes F7 and F8; see Figure 1), then EEG coherence is an ideal measure of interhemispheric neuroelectrical connectivity.

Only two studies have been published to date, however, examining the effects of saccadic horizontal eye movements on IhC. Propper, Pierce, Geisler, Christman, and Bellorado (2007) examined IhC from two frontal bilateral electrode sites (Fp1 and Fp2) before and after a 30-second presentation of either a two-saccadic-eye-movements-per-second moving dot or a stationary red/green twice per second blinking dot in a between-groups design. Their results obtained, in contradiction to their initial predictions, decreased coherence in the Gamma EEG frequency band (35-54 Hz), with no effects on Theta (4-8 Hz) or Alpha (8–13 Hz) bands, following the moving stimulus relative to the control blinking dot condition. The authors' posthoc interpretation of these surprising outcomes as indicating significant eye movementinduced changes in interhemispheric coordination notwithstanding, there were several critical problems with this study which render its relevance to EMDR practice and to task-related interhemispheric connectivity questionable. First, they selected two recording sites over the frontalis muscles, which are very sensitive to residual eye movement-induced muscle artifacts and recorded from these sites within 3 seconds of stimulus offset, potentially contaminating the EEG recordings with muscle artifacts which can be reflected in the Gamma and Delta bands. (They failed to report Delta, and approximately 20% of their

initial participant pool had to be rejected from analysis because of noisy, unusable EEGs.) Second, their EEG coherence values, particularly for Alpha and Theta, were very high, approaching 1.00, even prior to stimulus conditions, suggesting a ceiling effect and lessening the likelihood of obtaining significant and meaningful coherence changes. And third, there was no episodic memory recall task required during the eye movement condition, as occurs in EMDR, providing no directed task-specific activity as a basis for neural network coordination.

The second well-designed and tightly controlled study by Samara, Elzinga, Slagter, and Nieuwenhuis (2011) computed full-scalp EEG phase and amplitude coherence prior to participation in a neutral and emotional word-recall task and in the same BEM and control conditions as Propper et al. (2007) but using a more powerful within-subjects design. In addition, these researchers recorded electrooculograms to verify BEMs and painstakingly visually and statistically artifacted their EEG data to remove muscle and noise artifacts. Disappointingly for the IhC model, and following multiple and reduced stringency analyses, Samara et al. found no consistent or predicted phase or amplitude EEG coherence changes from pre- to post-BEMs or across eye movement conditions. They did observe significantly decreased Alpha amplitude coherence bilaterally for the F7-F8 electrodes in the BEM condition but an increase in Alpha amplitude coherence for these electrodes in the control condition. Although they found a significant improvement in recall of emotional words only for the BEM condition, there was no significant correlation between coherence and word recall. At first glance, this study considerably challenges the IhC model for the reported effectiveness of EMDR and more specifically for the well-documented improvements in memory retrieval following BEMs.

However, an important shortcoming of this study, acknowledged by the authors, was the absence of a true episodic memory retrieval task (Tulving, 1985) during the eye movement component of the study. Indeed, not only was the cognitive task used in this study a semantic memory recall task but also a 30-minute "neutral documentary" film followed word presentation and occurred before EEGs were recorded and BEMs were prompted. As noted earlier, the holding of the traumatic event in working memory during the BEMs is an important and unique characteristic of therapeutic EMDR. Very few of the published studies of the effects of BEMs on memory retrieval, in fact, used personally meaningful episodic memory tasks and instructed their participants to contemplate those memories in working memory during bilateral stimulation. The exceptions to this important omission were the second experiment conducted by Christman et al. (2003), which found selective enhancement of true episodic memories following BEMs, and the study of contemplation of childhood memories during BEMs by Christman et al. (2006), which found earlier offset of childhood amnesia. Neither of these studies, however, measured EEG coherence.

Until IhC is measured during or immediately following bilateral stimulation while the participant is contemplating personally meaningful episodic memories, the IhC model for the effects of EMDR on the reprocessing of traumatic memories remains untested. In addition, because the activation of remote neural networks proposed by the AIP model can also occur within hemispheres, this investigation examined intrahemispheric coherence. This study begins this line of investigation by the recording and analysis of multichannel interhemispheric and intrahemispheric EEG coherence following BEMs and two control conditions, during the contemplation of personally meaningful positive episodic memories. Positive memories were used in this investigation to avoid potentially retraumatizing our young nonclinical sample, to facilitate institutional review board (IRB) approval, and because of the practice of installing positive memories with bilateral saccades in the development of The Safe Place and Resources during clinical EMDR.

#### Methods

#### Participants

Participants were 30 right-handed female undergraduate students from a southwestern university recruited as nonclinical volunteers from the psychology department subject pool. Mean age was 19.13 years (SD = 2.56) and there was no significant age difference among the three treatment conditions (F = .854, p = .437). No participant reported present pregnancy or a history of head injury, unconsciousness, epilepsy, chronic pain, psychiatric or PTSD history, or neuropathy. Nine reported taking birth control medication, 2 were taking asthma medication, and 2 were taking an undisclosed other medication; medication use was evenly distributed across the three treatment conditions ( $\chi^2 = .5, p > .05$ ). Street drug use was minimal and occasional, with 1 participant reporting marijuana use, 5 reporting alcohol use, 3 reporting pain killer use, 1 reporting upper use, and 3 reporting other drug use; no participant reported using amphetamines, cocaine, benzodiazepines, downers, or ecstasy. Each

participant was randomly assigned to one of the three treatment conditions in this between-groups design. All participants received course credit for their participation in this study, and the study was approved by the Northern Arizona University (NAU) IRB.

#### Instruments

Prior to the EEG portion of the study, each participant completed a demographic information form containing relevant identifying information, age, gender, pregnancy status, hand preference, incidence of neurological conditions which could influence the EEG recording, and prescribed and recreational medication/drug use. In addition, each participant completed the Edinburgh Handedness Inventory (Oldfield, 1971) to verify right-hand preference. A 1–10 (10 = *very strong*) visual analogue scale (VAS) was used to record memory strength and vividness at baseline and after each stimulus set for each condition.

The control visual stimulation conditions consisted of (a) a stationary black dot 3 in. in diameter, the eye fixation (EF) condition, selected to control for effects of alternating visual stimulation in general, and (b) an alternating red/green dot also 3 in. in diameter which changed color every 500 milliseconds, the Blinking Dot (Blink) condition, patterned after the control condition reported in Experiment 2 by Christman et al. (2004). Both control conditions were presented on a laptop with a 15-in. monitor positioned directly in front of the participant at eye level and 30 in. away. To be as consistent as possible both with EMDR protocol and across participants, bilateral visual stimulation was provided by an EyeScan 2000S Light Bar (1994, NeuroTek Corporation, Wheat Ridge, Colorado) designed for clinical EMDR use. Bilateral saccades were set at one left-right or right-left saccade every 500 milliseconds, producing two eye movements per second, for 24 seconds. The light bar was positioned at eye level 35 cm (approximately 14 in.) from the participant.

EEG data were recorded using a Lexicor NRS-24C (1989, Lexicor Medical Technology, Inc., Boulder, Colorado) EEG recording system having a 512 Hz digital sampling rate, a 128 Hz low-pass antialiasing filter, and a fixed 0.5 Hz high-pass filter. The Lexicor NRS-24C used a Neurosearch-24 Acquisition Unit containing 24 channels of differential front–end preamplifiers followed by isolation amplifiers/transformers, ana-log-to-digital (A/D) converters, and optical isolators for participant protection. Resident Neurosearch-24 V4.1E EEG recording and analysis software was used to record raw EEG data into event files for each treatment condition. The 19-channel EEG data were

collected with an A/D conversion sampling rate set at 256 Hz, high-pass and low-pass filters set at .5 Hz and 60 Hz, respectively, and notch filter set at 60 Hz. The international 10-20 EEG electrode placement system was followed for the placement of the 19 monopolar Ag/AgCl electrodes onto the scalp using the Electro-Cap System (1983, Electro-Cap International, Inc., Eaton, Ohio) with mathematically linked-ear reference electrodes. Electrode impedances were adjusted to less than 5 kohms and to within 1 kohm of each other. Data were analyzed and artifacted using Nova Tech EEG Eureka! and MHyT data processing and analysis software (2000, Nova Tech EEG, Inc., Mesa, Arizona). Raw EEG data were twice visually artifacted by two trained and independent artifactors blind to treatment conditions using precisely written and exacting criteria to remove EMG and other noise artifact.1 EEG analysis software was employed to conduct fast Fourier transformations (FFT) and power spectral and coherence analyses of raw data and LORETA neuroimaging software (LORETA: Low Resolution Electromagnetic Tomographic Analysis, Zurich, Switzerland) was used to conduct topographic imaging and cortical localization of treatment effects. FFT analysis employed Hamming time domain tapering, Blackman frequency domain smoothing, an overlapping FFT windows advancement factor of 8, and a moving average smoothing filter of 3. In these analyses, 10 EEG frequency bins were examined: Delta (1-3.99 Hz), Theta (4-7.99 Hz), Low Theta (4-5.99 Hz), High Theta (6-7.99 Hz), Alpha (8-11.99 Hz), Low Alpha (8-9.99 Hz), High Alpha (10-11.99 Hz), Beta (12-30 Hz), Low Beta (12-19.99 Hz), and High Beta (20-30 Hz).

All data were recorded in a sound attenuated research suite, with participants seated comfortably and erect in a recliner. A mirror was positioned on the wall opposite from and oblique to the participant such that the researcher could observe the presence of eye movements and establish whether the eyes were opened or closed without the participant seeing their reflection in the mirror. All instructions were standardized and prerecorded to separate CDs for each condition.

#### Procedure

Participants were randomly assigned to scheduled EEG study times, and on arrival, they completed the requisite informed consent form and relevant questionnaires while the Electro-Cap was fitted and calibrated to the EEG recording system and clean EEG traces were established. After the participants were made comfortable and the visual stimulus was configured, the CD for the designated stimulus was started. The experimenter remained present throughout the session to operate the EEG equipment and to monitor eye movements.

Before presentation of the visual stimulus condition, a 5-minute EEG baseline was recorded with eyes closed during which the participants were asked to blank their mind and then to "allow whatever thought, feeling, or experience comes up" to be considered. After this baseline, the participants were invited to consider an episodic memory from their childhood which holds very positive emotions for them, to signal when this memory had been selected, to briefly report the memory, and to rate its strength and vividness on the VAS scale. Then they were instructed to focus on the visual stimulus (either the stationary black dot, the blinking red/green dot, or the bilateral moving dot on the light bar) while contemplating the positive episodic memory for 24 seconds. During the BEM condition, the participants were instructed to move only their eyes from side to side and not their head, and their cooperation with this instruction was verified by the researcher's observation of the reflected image in the mirror. Following the presentation of the visual stimulus condition, the participants were instructed to close their eyes; to blank their mind; and then to "contemplate whatever thoughts, feelings, or experiences come up" while a 1-minute EEG was recorded. At the end of this 1-minute recording period, the participants were asked to again report the "strength and vividness" of the memory on the 1-10 VAS scale. This sequence of visual stimulation, followed by blanking the mind, followed by contemplation during which a 1-minute EEG and memory strength and vividness were recorded was repeated five times for 5 minutes of EEG during contemplation of the positive episodic memory following presentation of the visual stimulus. After this sequence of recordings was completed, the participants were debriefed, the Electro-Cap was removed, extra credit was awarded, and the participants were allowed to leave.

#### Design and Analysis

Following the recording of the 5-minute eyes-closed baseline and the 5 minutes of eyes-closed poststimulus EEG, data were artifacted and subjected to FFT analysis. The mean number of artifact-free 1-second epochs/participant used in the coherence analyses was 228.10 (SD = 39.83) or an average of 3.80 minutes (SD = 0.66) of artifact-free EEG data for each participant for baseline and for poststimulus analyses separately. As a part of the Eureka! output, phase

coherence values between all possible pairs of electrodes for each designated EEG frequency are generated as cross-spectral density functions normalized by individualized power spectra, presented as a squared correlation matrix for each frequency. Phase coherence analyses used the following formula (Nunez & Srinivasan, 2006):

Coherence  $(f) = \frac{|\operatorname{Cross} - \operatorname{Spectrum}(f) XY|^2}{(\operatorname{Autospectrum}(f)(X))(\operatorname{Autospectrum}(f)(Y))}$ .

Reference placements for coherence computations were maintained as mathematically linked ears, given the suitability of this placement for relatively small electrode arrays (Nunez & Srinivasan, 2006; Thatcher, Biver, & North, 2004).

From this squared correlation matrix, coherence values for electrode pairs of interest were obtained. For our interests in IhC and to simplify the analysis by broad functional regions, we selected homologous electrode pairs in each hemisphere clustered by frontal (Fp1–Fp2, F3–F4, F7–F8), central (C3–C4), parietal (P3-P4), temporal (T3-T4, T5-T6), and occipital (O1–O2) regions; for frontal and temporal regions, coherence values for each electrode pair were averaged within each cluster to give five regional EEG coherence values for each frequency band (see Figure 1). As an additional exploratory analysis, intrahemispheric coherence was examined to investigate whether any of the conditions might increase coordination of neural networks within hemispheres. For each EEG frequency, left frontal (Fz-Fp1, Fz-F3, Fz-F7) and right frontal (Fz-Fp2, Fz-F4, Fz-F8), left central (Cz-C3, Cz-T3) and right central (Cz-C4, Cz–T4), left parietal (Pz–P3, Pz–T5) and right parietal (Pz-P4, Pz-T6), and left occipital (Pz-O1) and right occipital (Pz-O2) regional intrahemispheric coherence clusters were compared. To reduce the number of separate analyses, coherence values within each regional cluster (frontal, central, parietal) were averaged. These interhemispheric and intrahemispheric data clusters were then examined for normality and homogeneity of variance assumptions and were found to meet assumptions for further parametric analysis. Coherence values for each brain region were then examined among conditions for each of the 10 EEG frequency bands orthogonally for frequency and hemisphere by between-groups analysis of covariance (ANCOVA), with respective baseline values as the covariate. Because this was a small-n investigational study with planned comparisons and there were no

more comparisons than degrees of freedom for effect, no adjustment for inflation of family-wise error rate was required (Tabachnick & Fidell, 2013). Alpha for significance was set at .05.

In addition, to better localize functional brain regions potentially affected by visual stimulation during contemplation of positive episodic memories, Low Resolution Electromagnetic Tomographic Analysis (LORETA) was used. LORETA is a three-dimensional brain imaging software companion to contemporary EEG analyses allowing localization of deep cortical source potentials for recorded surface EEG signals (Pascual-Marqui, Esslen, Kochi, & Lehmann, 2002). LORETA algorithms compute a three-dimensional inverse solution space of cortical gray matter and hippocampi mapped onto a probabilistic Talairach atlas partitioned into 2394 7mm<sup>3</sup> volumetric units, or voxels. Brodmann anatomical labels may be reported for relevant regions of interest using the Montreal Neurological Institute realistic head model. For this study, LORETA analyses were conducted on the natural log transformation of FFT relative power spectral output for each identified frequency and relevant statistically significant cortical voxels are reported.

#### Results

Effects on Memory Strength and Vividness

Figure 2 presents graphically the changes in memory strength and vividness ratings for each condition from baseline across each of the five visual stimulation trials. Repeated measures analysis of variance (ANOVA) results show a significant main effect for time (*F*[5, 23] = 7.80, p < .0001,  $\eta^2 = .63$ ) but not for condition (*F*[2, 27] = .59, p = .56,  $\eta^2 = .04$ ) and no significant interaction (F[10, 46] = .54, p = .86,  $\eta^2 = .10$ ), indicating an increase in memory strength and vividness for the positive memory across time for all three conditions and no differences among conditions at any measurement point, including at baseline. An inspection of these graphs, however, reveals a different pattern of responses for the BEM condition compared with the two control conditions, with the latter tending to plateau at the third trial but memory continuing to increase rather consistently across all trials but one for the BEM condition. T-test comparisons between successive trials support this visual pattern difference with a significant increase for the EF condition only from Trial 2 to 3 (t[9] = 4.00, p =.002) and for the Blink condition only from Trial 1 to 2 (t[9] = 1.81, p = .05) but for the BEM condition from Trial 1 to 2 (t[9] = 1.96, p = .04), Trial 2 to 3 (t[9] =1.81, p = .05), and Trial 4 to 5 (t[9] = 1.81, p = .05).



FIGURE 2. Memory strength and vividness ratings across EEG measurement trials for each condition.

#### Interhemispheric Coherence Effects

The ANCOVA interhemispheric analyses obtained no significant condition main effects (all p > .05). Simple effects comparisons between each condition for each frequency revealed only one statistically significant condition effect, with the Blink condition showing higher coherence than EF for Central Theta (p = .028). There were statistical trends for BEM to show higher coherence than EF for Frontal Delta (p = .081) and than Blink for Occipital Low Alpha (p = .051) and for Blink to show higher coherence than BEM for Central Alpha (p = .054) and for Central (p = .066) and Parietal Beta (p = .096). No other conditions for any region or frequency reached statistical significance or trend status.

#### Intrahemispheric Coherence Effects

ANCOVA intrahemispheric analyses found several significant and trend condition main effects. For Right Frontal Delta, a statistical trend was obtained for condition (ANCOVA *F*[2, 26] = 3.161, *p* = .059,  $\eta^2 = .196$ ). Planned simple effects comparisons found the BEM condition to have significantly higher coherence than the Blink condition (*p* = .028) and a trend toward higher coherence relative to the EF condition

(p = .055). *T*-tests comparisons of changes before and after exposure to each of the conditions revealed a significant increase in BEM coherence for Right Frontal Delta (t[9] = -2.50, p = .017) but no significant changes for the EF (t[9] = -.25, p = .43) or Blink (t[9] = -.33, p = .38) conditions. Importantly, there were no significant or trend effects of any of the three conditions for Left Frontal Delta.

For Right Frontal Beta, there was a statistical trend for condition (ANCOVA F[2, 26] = 3.092, p = .062, $\eta^2$  = .192). Planned comparisons found the BEM condition to be significantly higher in coherence than the Blink condition (p = .022). To tease out the contributions of the Low Beta and High Beta frequency bins to this Beta effect, analyses of Right Frontal Low Beta (ANCOVA *F*[2, 26] = 4.647, p = .019,  $\eta^2 = .263$ ) revealed the BEM (p = .008) and EF (p = .034) conditions to be significantly higher in coherence than the Blink condition and the Right Frontal High Beta (ANCOVA  $F[2, 26] = 2.340, p = .116, \eta^2 = .153$ ) BEM condition to be significantly higher than Blink (p = .044). For Left Frontal Low Beta (ANCOVA *F*[2, 26] = 2.315, p = .119,  $\eta^2$  = .151), the BEM condition was found to be significantly higher than Blink (p = .042). Figures 3–5 show the changes in Right Frontal Low Beta, Right Frontal High Beta, and Left







FIGURE 4. Right Frontal High Beta EEG coherence changes across time for each condition.



FIGURE 5. Left Frontal Low Beta EEG coherence changes across time for each condition.

Frontal Low Beta coherence descriptively from before to after exposure for each of the conditions, revealing increases in BEM coherence, decreases in Blink coherence, and slight decreases or no remarkable changes in EF coherence. T-tests comparisons of these changes before and after exposure to each of the conditions are presented in Table 1, showing a significant increase in BEM coherence for Left Frontal Low Beta and a statistical trend toward an increase for Right Frontal Low Beta, with a corresponding significant decrease in Blink coherence for Right Frontal Low Beta and a trend toward a decrease for Right Frontal High Beta, and with no significant or trend changes in coherence for the EF condition. No other cortical regions or frequencies revealed significant effects of BEMs relative to the two control conditions on EEG intrahemispheric coherence.<sup>2</sup>

#### Localization of Bilateral Eye Movement Effects

LORETA neuroimaging cortical source localization algorithms were applied to the EEG relative power spectral data derived from the five combined 1-minute recording epochs following engagement in each of the three conditions. This imaging process produces virtual magnetic resonance imaging (MRI) images of the cortical regions significantly activated during each of the conditions. For our interest in this study, only the LORETA images for the BEM condition are displayed. Figure 6 shows superior, posterior, left lateral, inferior, anterior, and right lateral images of Low Beta activation following BEMs. The shaded areas reflect activation in Brodmann Areas 10 and 11 in the right superior and middle frontal gyri.

#### Discussion

The outcomes of this study provide little support for an IhC model for the therapeutic effects of EMDR. There were only trends for BEMs to show enhanced coherence between hemispheres relative to the EF and alternating red/green light conditions, and these trends were toward slow wave, Delta and Low Alpha, coherence increases, electrocortical frequencies not generally associated with information processing. Klimesch et al. (Klimesch, 1999; Klimesch, Sauseng, & Hanslmayr, 2007) have suggested that alpha synchronization may reflect an inhibitory process in preparation for memory retrieval and subsequent cognitive processing. It is tempting to speculate that this Low

Condition/Hemisphere/Frequency	Difference Mean (SE)	<i>t</i> value	<i>p</i> value
Eye fixation			
Left Frontal Beta	.016 (.017)	0.922	.191
Left Frontal Low Beta	.003 (.013)	0.194	.426
Left Frontal High Beta	.018 (.015)	1.196	.131
Right Frontal Beta	.006 (.021)	0.274	.396
Right Frontal Low Beta	000 (.014)	-0.017	.494
Right Frontal High Beta	.005 (.018)	0.252	.404
Red/green blink			
Left Frontal Beta	.018 (.016)	1.137	.143
Left Frontal Low Beta	.017 (.014)	1.197	.131
Left Frontal High Beta	.022 (.021)	1.012	.169
Right Frontal Beta	.048 (.024)	1.999	.039*
Right Frontal Low Beta	.042 (.017)	2.437	.019*
Right Frontal High Beta	.050 (.028)	1.770	.055
Bilateral eye movements			
Left Frontal Beta	026 (.020)	-1.329	.108
Left Frontal Low Beta	028 (.015)	-1.869	.047*
Left Frontal High Beta	017 (.024)	-0.710	.248
Right Frontal Beta	023 (.016)	-1.452	.090
Right Frontal Low Beta	017 (.011)	-1.538	.079
Right Frontal High Beta	022 (.022)	-1.001	.172

# TABLE 1. Paired Samples (Baseline to Posttreatment) t-Test Results for Frontal Beta Intrahemispheric Coherence Effects

*Note.* All *t* tests are 1-tailed tests with df = 9. Negative difference mean  $\rightarrow$  coherence

after treatment was larger than before.

\*p < .05.

Alpha trend occurring in occipital regions may suggest beginning coherent activity in processing areas involved in retrieval of visual components of the elicited positive memories. This speculation will have to await larger studies for further validation.

There was, however, support from this study for an intrahemispheric coherence model for EMDR effects. For higher EEG frequencies and frontal cortical regions, both well-substantiated as involved in higher order information processing, BEMs were associated with enhanced EEG coherence. Specifically, Left and Right Frontal Low Beta and Right Frontal High Beta frequencies showed increased coherence following BEM stimulation during the contemplation of a positive emotional memory, relative to decreases in coherence for the Blink condition and no changes for the EF condition. Furthermore, this pattern of differential effects among the three conditions was consistent across other cortical regions for the Beta frequency, although these observations did not approach significant or trend levels. And these Frontal Beta EEG changes were associated with a more continuous and unique pattern of increase in the strength and vividness of the targeted positive episodic memory.

LORETA neuroimaging results were also consistent with right prefrontal activation in the Low Beta frequency range. There is a growing body of research indicating the involvement of the right prefrontal cortex in negative affective states (Davidson, 1995, 2002) and in empathic responding (Tullett, Harmon-Jones, & Inzlicht, 2012). It is interesting that our study found increased Low and High Beta coherence and increased Low Beta spectral power in the right prefrontal cortex during the contemplation of positive affective states. These findings would appear to contradict those of Davidson; however, our study also found increased coherence in left prefrontal cortex, a



**FIGURE 6.** LORETA EEG neuroimaging orthographic views for Low Beta spectral power following bilateral eye movements during contemplation of a positive emotional memory (shaded areas represent significantly increased power relative to nonshaded areas).

region reputedly involved in positive affective states as well (Davidson, 2002). We can only speculate at the present time that the cognitive task of contemplation of positive emotional memories during bilateral stimulation involved a balanced recruitment of both left and right emotional processing regions, although not an interconnection of left and right hemispheres as would be seen with increased IhC.

We also found increased coherence for the BEM condition in the Delta frequency in the right frontal lobe. One may be tempted to interpret this increased slow wave coherence as a residual artifact of the BEM activity occurring prior to the EEG recording. There are a couple of reasons for why we believe this not to be the case. First, we painstakingly visually double artifacted all EEG files with particular attention to possible eye movement artifacts in frontal electrodes using written procedures, criteria, and training established in over a decade of EEG research in our laboratories. In addition, if this increased Delta coherence were because of BEM artifacts, it would occur on both the left and right sides, which was not the case in this analysis. We believe that another explanation of this Delta coherence finding is more tenable. Although the Delta EEG rhythm has been historically associated with early developmental stages, sleep, and certain pathological processes, it more recently has been found to be related to brain synchronization with autonomic functions, certain reward-based and defensive motivational states, and attention to and detection of salient environmental stimuli (Knyazev, 2012). Given that our participants had just been treated to a positive, and we hope rewarding, emotional mnemonic experience, it seems more plausible that this enhanced Delta coherence could reflect attention to this positive emotional state.

The prefrontal cortex has long been associated with executive functions, more specifically with the planning of complex behavior, differentiating positive from negative, predicting outcomes, decision making, personality expression, and prosocial behavior—many of the processes involved in the selection and contemplation of a positive emotional memory. Brodmann Areas 10 and 11, identified from the neuroimaging results, are subdivisions of the prefrontal cortex more specifically involved in episodic memory retrieval, reward-mediated behavior, cognitive empathy, and cognitive flexibility and originality (Ramnani & Owen, 2004; Trans Cranial Technologies, 2012). It is consistent with the task demands of this study that these regions showed significantly enhanced activation and coherence following BEMs during the recall of positive episodic memories for the EEG frequency most associated with focus and attention-Low Beta (Bergmann, 2008). Furthermore, these localization outcomes are consistent with single-photon emission computed tomography (SPECT) studies showing increased blood flow in limbic and PFC areas following EMDR and may reflect a recoupling of amygdala-ACC/PFC regions, as described earlier (Pagani et al., 2013).

It is important to note that prior EEG studies of coherence effects of BEMs have not done so during memory contemplation, as occurs in EMDR therapy. We believe this to be an important omission of the few earlier studies because to do so has limited application to the formal process of EMDR. Our study employed positive memory contemplation during BEMs. The constellation of outcomes is very likely heavily influenced by the specific task used in our study, and those outcomes will likely be different or include additional regions for the contemplation of negative or traumatic memories. Indeed, the neuroimaging results and localization of cortical coherence effects appeared to be quite specific to the cognitive processes involved in this unique task. We would expect other distinct cortical regions with functions specific to the directed task to show enhanced coherence and activation. For example, during the contemplation of negative or traumatic memories, we might expect these same regions mentioned earlier to be involved, with the addition of more frontal medial areas reflecting activation of the AC and amygdala subcortices. These speculations await further EEG coherence and neuroimaging studies.

Regarding such future EEG studies of BEMs, observation of the Blink condition outcomes found the alternating red/green visual fixation control condition used in earlier studies by Propper et al. (2007) and by Samara et al. (2011) to have rather remarkable effects on EEG coherence. In a posthoc IhC analysis, Blink Central Theta coherence was found to be significantly higher than in the EF condition (p = .028), and in a similar intrahemispheric analysis, Blink coherence was significantly higher than EF coherence for

Right Parietal Delta (p = .04) and for Left Parietal Theta (p = .024), with a similar pattern of trends for other left/right central and parietal sites for these low frequencies. Indeed, the alternating red/green EF condition appeared to rather consistently increase low frequency coherence in central and parietal cortical regions and to decrease high frequency coherence in frontal regions. This effect stands in contrast to a tendency for the BEM stimulus to decrease low frequency coherence and to increase high frequency coherence in specific cortical regions. Given that Delta and Theta frequencies are traditionally associated with sedation, sleep, and trancelike states and that Beta frequencies are associated with focused attention, alertness, and associative functions (Bergmann, 2008; Stevens et al., 2004), the general outcome of this study is consistent with enhanced alertness, focus, and associations during BEM stimulation and a contradictory deactivation of cognitive processing during the Blink condition. Although comparing the BEM condition to the Blink condition may increase magnitude of effect, using an alternating red/green blinking dot as a control condition with which to compare BEMs may not be the best choice for a control comparison condition and may have limited external validity.

Of course, it is possible that our obtained differences between the BEM condition and the controls had somewhat to do with the presentation of the control conditions on a computer screen and the use of a light bar for bilateral stimulation. However, we feel that the light bar better captures and standardizes the BEMs stimulation more commonly found in clinical settings than the alternating dots appearing on either side of a computer screen used in earlier studies. Thus, we feel that our results are more externally valid than those obtained from computer-generated dots. It is noteworthy in this regard that a constructive replication of this study that used the light bar for all three conditions, currently under analysis, obtained a similar differential effect among the three conditions.

An interesting non-EEG outcome of our study concerned the finding of increased memory strength and vividness following all three conditions, with a different pattern of increases for the BEM condition. This outcome is a rather glaring contradiction to an extensive body of research which finds decreased memory vividness for positive and negative memories following BEMs (Engelhard, van Uijen, & van den Hout, 2010; Gunter & Bodner, 2008; Hornsveld et al., 2011; Maxfield, Melnyk, & Hayman, 2008; van den Hout, Eidhof, Verboom, Littel, & Engelhard, 2013; van den Hout & Engelhard, 2012; van den Hout, Muris, Salemink, & Kindt, 2001). The typical design for these studies is to have participants recall a memory, to rate its vividness, then to recall the memory again during several eye movement or fixation conditions, then, after a variable waiting period, to again rate the memory vividness immediately following recall and condition presentation. Most frequently, memories following eye movements are rated as less vivid than memories following EF alone (Maxfield et al., 2008; van den Hout et al., 2013). This basic design and outcomes, called "imagination deflation," have been advanced to support a working memory hypothesis for EMDR, that being a saturation of the visuospatial sketchpad (Andrade, Kavanagh, & Baddeley, 1997) or the central executive (Gunter & Bodner, 2008) in working memory by the simultaneous focusing on the memory and on eye movements, producing a blurring and subsequent weakening of memory vividness.

Yet, as reported in our study, memory strength and vividness ratings were found to significantly increase across all conditions but to more consistently increase for the BEM condition. How do we explain this contradiction to an established body of literature? Well, there is a fundamental difference between our study design and the designs of the studies reported earlier. In our study, more consistent with EMDR practice, ratings of memory vividness were conducted after each of five sequential 1-minute processing periods following presentation of the stimulus condition. In the classic working memory bilateral stimulation research design, vividness is assessed immediately following condition presentation, with no processing period allowed. In fact, our review of this eye movement literature found only one study (Lee & Drummond, 2008) which reported assessing vividness after Phase 4 of clinical EMDR practice, the repeated elicitation of the memory with bilateral stimulation, each time followed by a brief processing period until subjective units of disturbance (SUDs) ratings were reduced to 0 (Shapiro, 2001). And these authors failed to obtain a decrease in vividness when participants were "reliving" the memory but did find a decrease when they were instructed to distance themselves from the memory, and this effect was only found immediately after desensitization and not on follow-up a week later. We feel that this design difference explains our apparently contradictory results.

However, rather than challenge the working memory hypothesis on this procedural discrepancy, we would like to offer an alternative explanation for the effects of BEMs in EMDR practice. We would suggest that EMDR works in a 2-stage process. In the first stage, memories are blurred and deflated via a working memory saturation process, well-described, and

supported in research contributions by van den Hout et al. (2013; van den Hout & Engelhard, 2012), Maxfield et al. (2008), Gunter and Bodner (2008), Andrade et al. (1997), and others. However, this desensitization effect is followed in common EMDR practice by a second reprocessing stage during which associative links are formed between the now blurred memory trace and related mnemonic experiences, resulting in an increase in memory vividness of a more constructive reframe of the original memory. Maxfield et al. (2008) have suggested just such a sequence of targeted deterioration of the original memory trace followed by increased vividness through subsequent constructive associative linkages. Our enhanced EEG coherence outcomes with positive memories offer very tentative support for this second stage. Such a two-stage process can easily be tested by simply extending the present working memory paradigm to include an assessment of memory vividness after a subsequent processing period. If this sequence of effects is confirmed by further studies of this nature, they may explain why Dr. Shapiro, quite perceptively, christened this technique Eye Movement Desensitization and Reprocessing.

Indeed, the support of this study for enhanced intrahemispheric coherence does not at all negate the numerous other models offered to explain the operative mechanisms for EMDR. There are likely multiple mechanisms underlying the efficacy of EMDR, for an intervention so clinically powerful and a brain so virtually infinite in its potential are likely too complex to be subsumed under the propositions of one model alone. This hyperbole notwithstanding, we offer here tentative support for an elaboration of one of the early such models for the efficacy of EMDR, IhC, suggesting a broadening of that model to include functional cortical regions specific to the therapeutic processing of identified memories. Consistent with research outcomes by Lyle et al. (Edlin & Lyle, 2013; Lyle & Jacobs, 2010; Lyle & Martin, 2010; Lyle & Orsborn, 2011) suggesting a primarily intrahemispheric manifestation of saccade-induced cognitive enhancement (SICE), we hypothesize a cortical coherence approach in which diffuse cortical pathways specific to the type of bilateral stimulation employed (visual, auditory, kinesthetic, etc.) establish a heightened level of activation, pathways which are then more easily recruited during the subsequent processing of the target event (positive, negative, or traumatic memories). This recruitment may involve activation of neural networks across hemispheres (interhemispheric), which would then manifest as increased IhC, or within hemispheres (intrahemispheric), which would be reflected in increased coherence in more localized cortical regions.

Of course, this suggestion is based on a rather smalln EEG study with a nonclinical population recalling positive memories and must be tentative at this point. However, we hope that these outcomes and theoretical speculations will stimulate follow-up studies to further test our hypotheses.

In our study of positive emotional memories, as would likely occur during Safe Place or Resource installation in the early stages of EMDR, cognitive activities perhaps not requiring additional processing and consequent involvement of dissociated or remote neural networks, it appears that rather circumscribed right and left neural networks were recruited. An investigation of negative or traumatic memories, which have yet to be thoroughly processed and integrated, would be expected to see the recruitment of more and remote networks into the targeted memory through these bilateral stimulation pathways and thus both inter- and intrahemispheric coherence increases within and across specific cortical regions. This extended hypothesis has yet to be more comprehensively examined, but research currently being analyzed in our laboratory is hoped to better illuminate these proposed mechanisms.

#### Notes

1. We routinely do not use automated independent component analysis (ICA)/principal component analysis (PCA) artifacting procedures in our EEG lab because over a decade of experience has shown us that when we use this software, we still must followup with visual artifacting to remove remaining noise artifacts. We have opted to instead adopt a detailed written protocol for artifacting, and the second author (LS) conducts a hands-on workshop with research assistants every year in which these criteria are taught and checked with real data to see that they are being followed. In addition, all EEG files are blind and double artifacted to ensure that our data files are clean of any non-EEG noise. Our protocol is available on request from the second author (LS).

2. As a further check on the possible contribution of eye movement muscle artifacts to observed frontal pole EEG effects, these analyses were run again with the Fp1 and Fp2 electrodes removed. The same pattern of significant and trend effects were obtained in this reanalysis.

#### References

American Psychiatric Association. (2004). Practice guidelines for the treatment of patients with acute stress disorder and posttraumatic stress disorder. Arlington, VA: Author.

- Andrade, J., Kavanagh, D., & Baddeley, A. (1997). Eyemovements and visual imagery: A working memory approach to the treatment of post-traumatic stress disorder. *British Journal of Clinical Psychology*, *36*, 209–223.
- Bergmann, U. (2008). The neurobiology of EMDR: Exploring the thalamus and neural integration. *Journal of EMDR Practice and Research*, 2(4), 300–314.
- Bisson, J. I., Ehlers, A., Mathews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder: Systematic review and meta-analysis. *British Journal of Psychiatry*, 190, 97–104.
- Christman, S. D., Garvey, K. J., Propper, R. E., & Phaneuf, K. A. (2003). Bilateral eye movements enhance the retrieval of episodic memories. *Neuropsychology*, *17*, 221–229.
- Christman, S. D., & Propper, R. E. (2001). Superior episodic memory is associated with interhemipheric processing. *Neuropsychology*, *15*, 607–616.
- Christman, S. D., Propper, R. E., & Brown, T. J. (2006). Increased interhemispheric interaction is associated with earlier offset of childhood amnesia. *Neuropsychology*, *20*, 336–345.
- Christman, S. D., Propper, R. E., & Dion, A. (2004). Increased interhemispheric interaction is associated with decreased false memories in a verbal converging semantic associates paradigm. *Brain and Cognition*, *56*, 313–319.
- Cronin-Golomb, A., Gabrieli, J. D. E., & Keane, M. M. (1996). Implicit and explicit memory retrieval within and across the disconnected cerebral hemispheres. *Neuropsychology*, *10*, 254–262.
- Cukor, J., Olden, M., Lee, F., & Difede, J. (2010). Evidencebased treatments for PTSD, new directions, and special challenges. *Annals of the New York Academy of Sciences*, 1208, 82–89.
- Davidson, P. R., & Parker, K. C. H. (2001). Eye movement desensitization and reprocessing (EMDR): A metaanalysis. *Journal of Consulting and Clinical Psychology*, 69, 305–316.
- Davidson, R. J. (1995). Cerebral asymmetry, emotion, and affective style. In R. J. Davidson & K. Hugdahl (Eds.), *Brain asymmetry* (pp. 361–387). Cambridge, MA: MIT Press.
- Davidson, R. J. (2002). Anxiety and affective style: Role of prefrontal cortex and amygdala. *Biological Psychiatry*, *51*, 68–80.
- Devilly, G. J., & Spence, S. H. (1999). The relative efficacy and treatment distress of EMDR and a cognitive-behavior trauma treatment protocol in the amelioration of posttraumatic stress disorder. *Journal of Anxiety Disorders*, *13*, 131–157.
- Edlin, J. M., & Lyle, K. B. (2013). The effect of repetitive saccade execution on the attention network test: Enhancing executive function with a flick of the eyes. *Brain and Cognition*, *81*, 345–351.

- Electro-Cap System [Apparatus]. (1983). Eaton, Ohio: Electro-Cap International.
- Engelhard, I. M., van Uijen, S. L., & van den Hout, M. A. (2010). The impact of taxing working memory on negative and positive memories. *European Journal of Psychotraumatology*, *1*, 1–8.
- EyeScan 2000S Light Bar [Apparatus]. (1994). Wheat Ridge, Colorado: NeuroTek Corporation.
- Francati, V., Vermetten, E., & Bremner, J. D. (2007). Functional neuroimaging studies in posttraumatic stress disorder: Review of current methods and findings. *Depression and Anxiety*, 24, 202–218.
- Gunter, R. W., & Bodner, G. E. (2008). How eye movements affect unpleasant memories: Support for a working-memory account. *Behaviour Research and Therapy*, 46, 913–931.
- Harper, M. (2012). Taming the amygdala: An EEG analysis of exposure therapy for the traumatized. *Traumatology*, 18(2), 61–74.
- Harper, M. L., Rasolkhani-Kaohorn, T., & Drozd, J. F. (2009). On the neural basis of EMDR therapy: Insights from qEEG studies. *Traumatology*, *15*, 81–95.
- Hornsveld, H. K., Houtveen, J. H., Vroomen, M., Kapteijn, I., Aalbers, D., & van den Hout, M. A. (2011). Evaluating the effect of eye movements on positive memories such as those used in resource development and installation. *Journal of EMDR Practice and Research*, *5*(4), 146–155.
- Ironson, G., Freud, B., Strauss, J. L., & Williams, J. (2002). Comparison of two treatments for traumatic stress: A community-based study of EMDR and prolonged exposure. *Journal of Clinical Psychology*, 58, 113–128.
- Klimesch, W. (1999). EEG alpha and theta oscillations reflect cognitive and memory performance: A review and analysis. *Brain Research Reviews*, *29*, 169–195.
- Klimesch, W., Sauseng, P., & Hanslmayr, S. (2007). EEG alpha oscillations: The inhibition-timing hypothesis. *Brain Research Reviews*, *53*, 63–88.
- Knott, V. J., LaBelle, A., Jones, B., & Mahoney, C. (2002). EEG coherence following acute and chronic clozapine in treatment-resistant schizophrenics. *Experimental and Clinical Psychopharmacology*, 10(4), 435–444.
- Knyazev, G. G. (2012). EEG delta oscillations as a correlate of basic homeostatic and motivational processes. *Neuroscience and Biobehavioral Reviews*, *36*, 677–695.
- Lamprecht, F., Kohnke, C., Lempa, W., Sack, M., Matzke, M., & Munte, T. E. (2004). Event-related potentials and EMDR treatment of post-traumatic stress disorder. *Neuroscience Research*, 49, 267–272.
- Lee, C. W., & Drummond, P. D. (2008). Effects of eye movement versus therapist instructions on the processing of distressing memories. *Journal of Anxiety Disorders*, *22*, 801–808.
- Lee, C., Gavriel, H., Drummond, P., Richards, J., & Greenwald, R. (2002). Treatment of PTSD: Stress inoculation training with prolonged exposure compared to EMDR. *Journal of Clinical Psychology*, *58*, 1071–1089.

- Lexicor NRS-24C [Apparatus]. (1989). Boulder, Colorado: Lexicor Medical Technology.
- LORETA: Low Resolution Electromagnetic Tomographic Analysis [Computer software]. Zurich, Switzerland: The KEY Institute for Brain-Mind Research.
- Lyle, K. B., & Jacobs, N. E. (2010). Is saccade-induced retrieval enhancement a potential means of improving eyewitness evidence? *Memory*, *18*(6), 581–594.
- Lyle, K. B., Logan, J. M., & Roediger, H. L. (2008). Eye movements enhance memory for individuals who are strongly right-handed and harm it for individuals who are not. *Psychonomic Bulletin and Review*, 15, 515–520.
- Lyle, K. B., & Martin, J. M. (2010). Bilateral saccades increase intrahemispheric processing but not interhemispheric interaction: Implications for saccade-induced retrieval enhancement. *Brain and Cognition*, *73*, 128–134.
- Lyle, K. B., & Orsborn, A. E. (2011). Inconsistent handedness and saccade execution benefit face memory without affecting interhemispheric interaction. *Memory*, *19*(6), 613–624.
- Maxfield, L., Melnyk, W. T., & Hayman, C. A. G. (2008). A working memory explanation for the effects of eye movements in EMDR. *Journal of EMDR Practice & Research*, 2(4), 247–261.
- MHyT [Apparatus and software]. (2000). Mesa, Arizona: Nova Tech EEG.
- Neurosearch-24 V4.1E [Software]. (1989). Boulder, Colorado: Lexicor Medical Technology.
- Nova Tech EEG Eureka! [Apparatus and software]. (2000). Mesa, Arizona: Nova Tech EEG.
- Nunez, P. L., & Srinivasan, R. (2006). *Electric fields in the brain: The neurophysis of EEG* (2nd ed.). New York, NY: Oxford University Press.
- Nunez, P. L., Srinivasan, R., Westdorp, A. F., Wijesinghe, R. S., Tucker, D. M., Silberstein, R. B., & Cadusch, P. J. (1997). EEG coherency I: Statistics, reference electrode, volume conduction, Laplacians, cortical imaging, and interpretation at multiple sites. *Electroencephalography* and Clinical Neurophysiology, 103, 499–515.
- Oldfield, R. (1971). The assessment and analysis of handedness: The Edinburgh inventory. *Neuropsychologia*, *9*, 97–113.
- Pagani, M., Hogberg, G., Fernandez, I., & Siracusano, A. (2013). Correlates of EMDR therapy in functional and structural neuroimaging: A critical summary of recent findings. *Journal of EMDR Practice and Research*, 7(1), 29–38.
- Parker, A., Buckley, S., & Dagnall, N. (2009). Reduced misinformation effects following saccadic bilateral eye movements. *Brain and Cognition*, 69, 89–97.
- Pascual-Marqui, R. D., Esslen, M., Kochi, K., & Lehmann, D. (2002). Functional imaging with low resolution brain electromagnetic tomography (LORETA): A review. *Methods and Findings in Experimental and Clinical Pharma*cology, 24(Suppl. C), 91–95.
- Power, K., McGoldrick, T., Brown, K., Buchanan, R., Sharp,D., & Swanson, V. (2002). A controlled comparison of eye movement desensitization and reprocessing versus

exposure plus cognitive restructuring versus waiting list in the treatment of posttraumatic stress disorder. *Clinical Psychology and Psychotherapy*, *9*, 299–318.

- Propper, R. E., & Christman, S. D. (2008). Interhemispheric interaction and saccadic horizontal eye movements: Implications for episodic memory, EMDR, and PTSD. *Journal of EMDR Practice and Research*, *2*, 269–281.
- Propper, R. E., Pierce, J., Geisler, M. W., Christman, S. D., & Bellorado, N. (2007). Effect of bilateral eye movements on frontal interhemispheric gamma EEG coherence: Implications for EMDR therapy. *The Journal of Nervous and Mental Disease*, 195(9), 785–788.
- Ramnani, N., & Owen, A. M. (2004). Anterior prefrontal cortex: Insights into function from anatomy and neuroimaging. *Nature Reviews: Neuroscience*, *5*, 184–194.
- Rothbaum, B. O., Astin, M. C., & Marsteller, F. (2005). Prolonged exposure versus eye movement desensitization and reprocessing (EMDR) for PTSD rape victims. *Journal of Traumatic Stress*, *18*, 607–616.
- Samara, Z., Elzinga, B. M., Slagter, H. A., & Nieuwenhuis, S. (2011). Do horizontal saccadic eye movements increase interhemispheric coherence? Investigation of a hypothesized neural mechanism underlying EMDR. *Frontiers in Psychiatry*, 2(4), 1–9.
- Servan-Schreiber, D. (2000). Eye movement desensitization and reprocessing: Is psychiatry missing the point? *Psychiatrc Times*, 17, 36–40.
- Shapiro, F. (1989). Efficacy of the eye movement desensitization procedure in the treatment of traumatic memories. *Journal of Traumatic Stress Studies*, *2*, 199–223.
- Shapiro, F. (2001). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures (2nd ed.). New York, NY: Guilford Press.
- Shapiro, F., & Maxfield, L. (2002). Eye movement desensitization and reprocessing (EMDR): Information processing in the treatment of trauma. *Journal of Clinical Psychology*, 58, 933–946.
- Shobe, E. R., Ross, N. M., & Fleck, J. I. (2009). Influence of handedness and bilateral eye movements on creativity. *Brain and Cognition*, *71*, 204–214.
- Solomon, R. M., & Shapiro, F. (2008). EMDR and the adaptive information processing model: Potential mechanism for change. *Journal of EMDR Practice and Research*, 2(4), 315–325.
- Stevens, L. C., Brady, B., Goon, A., Adams, D., Rebarchik,
  J., Gacula, L., . . . Verdugo, S. (2004). Electrophysiological alterations during hypnosis for ego-enhancement:
  A preliminary investigation. *American Journal of Clinical Hypnosis*, 46(4), 323–344.
- Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics (6th ed.). Upper Saddle River, NJ: Pearson Education.
- Taylor, S., Thordarson, D. S., Maxfield, L., Fedoroff, I. C., Lovell, K., & Orgodniczuk, J. (2003). Compara-

tive efficacy, speed, and adverse effects of three PTSD treatments: Exposure therapy, EMDR, and relaxation training. *Journal of Consulting and Clinical Psychology*, *71*, 330–338.

- Thatcher, R. W., Biver, C. J., & North, D. (2004). *EEG coherence and phase delays: Comparisons between single reference, average reference, and current source density.* Unpublished manuscript, NeuroImaging Lab, VA Medical Center, Bay Pines, FL. Retrieved from http://www.appliedneuroscience.com/COMPARISONS-COMMONREF-AVE-LAPLACIAN.pdf 64
- Trans Cranial Technologies. (2012). *Cortical functions*. Kowloon, Hong Kong, China: Trans Cranial Technologies, Ltd.
- Tullett, A. M., Harmon-Jones, E., & Inzlicht, M. (2012). Right frontal cortical asymmetry predicts empathic reactions: Support for a link between withdrawal motivation and empathy. *Psychophysiology*, 49, 1145–1153.
- Tulving, E. (1985). How many memory systems are there? *American Psychologist*, 40(4), 385–398.
- van den Hout, M. A., Eidhof, M. B., Verboom, J., Littel, M., & Engelhard, I. M. (2013). Blurring of emotional and non-emotional memories by taxing working memory during recall. *Cognition & Emotion*, 1–10.
- van den Hout, M. A., & Engelhard, I. M. (2012). How does EMDR work? *Journal of Experimental Psychopathology*, *3*(5), 724–738.
- van den Hout, M. A., Muris, P., Salemink, E., & Kindt, M. (2001). Autobiographical memories become less vivid and emotional after eye movements. *British Journal of Clinical Psychology*, 40, 121–130.
- Weiss, S., & Mueller, H. M. (2003). The contribution of EEG coherence to the investigation of language. *Brain and Language*, *85*, 325–343.

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Correspondence regarding this article should be directed to Dr. Larry Stevens, Northern Arizona University, Department of Psychological Sciences, Box 15106, Flagstaff, AZ 86011. E-mail: Larry.Stevens@nau.edu

## Eye Movement Desensitization and Reprocessing Treatment of Nightmares: A Case Report

Matthew Woo

National University of Singapore, Institute of Mental Health, Singapore

A single client with depression and chronic nightmares was treated with 4 sessions of eye movement desensitization and reprocessing (EMDR) and showed a decrease in nightmares and improvement in general well-being. The client's 2 nightmare images were resolved following Luber's (2010) protocol for nightmare processing. Treatment effects were measured with the Outcome Rating Scale and showed a shift from the clinical range at pretreatment to the nonclinical range at the third session. The ready improvement and gains of this patient have served to highlight various aspects of the EMDR procedures which have worked well for the client, which included targeting the negative cognitions surrounding the theme of helplessness as well as adapting the positive cognition with a collectivistic orientation.

**Keywords:** chronic nightmares; depression; treatment; eye movement desensitization and reprocessing (EMDR); case report; Singapore

ye movement desensitization reprocessing (EMDR) therapy was a treatment described for the first time by Francine Shapiro (1989a, 1989b) for the treatment of traumatic memories and stress-related symptoms present in posttraumatic stress disorder (PTSD). During EMDR therapy, the client attends to emotionally disturbing material while focusing on to an external stimulus. The most commonly used external stimulus is the eye movement, but a variety of other bilateral stimuli include hand tapping and audio stimulation. Shapiro (2001) has explained that EMDR therapy facilitates the accessing of the traumatic memory network, which enhances information processing and forging new associations between the traumatic memory and more adaptive memories or information. These new associations result in enhanced information processing and learning, elimination of emotional distress, as well as consolidation of cognitive insights.

#### The Evidence for Treatment of Nightmares

The International Classification of Sleep Disorders (2nd ed.; ICSD-2; 2005) defines nightmares as "coherent dream sequences that seem real and become increasingly more disturbing as they unfold. Emotions usually involve anxiety, fear or terror, but also frequently involve anger, rage, embarrassment, disgust and other negative feelings. The dream content most often focuses on imminent physical danger to the individual, but may also involve other distressing themes." Most nightmares and sleep difficulties are frequently experienced by those suffering from PTSD, with some researchers claiming that nightmares are the hallmark symptoms of PTSD (Ross, Ball, Sullivan, & Carroff, 1989). Nightmares occur frequently in the context of rapid eye movement (REM) sleep and would usually awaken the sleeper (Ferini-Strambi & Fantini, 2008), with most people being able to provide an elaborate account of their dreams upon awakening from the nightmare (Leung & Robson, 1993).

The literature is burgeoning with outcome studies that suggest the application of imagery rescripting or imagery rehearsal techniques to trauma-related nightmares (Krakow & Zadra, 2006; Lancee, Spoormaker, Krakow, & van den Bout, 2008). In imagery rehearsal therapy (IRT), the patient is instructed to modify a recurrent nightmare while awake by verbal and written rehearsal of a new script in which the unpleasant ending or other portions of the nightmare are replaced with a more pleasant one. In fact, a group of researchers (Aurora et al., 2010) has recommended IRT as Level A, which is the highest level of recommendation among nonpharmacological treatment

options based on evidence collected from several studies (Forbes et al., 2003; Germain & Nielson, 2003; Krakow, Hollifield, & Johnston, 2001; Krakow, Johnston, & Melendrez, 2001; Krakow, Melendrez, & Johnston, 2002). Among the studies looked at by Aurora et al. (2010) for the efficacy of IRT, the research by Krakow, Hollifield, et al. (2001) is the only study at Level 1 (high-quality randomized clinical trials with narrow confidence intervals). The recommendations are based on the classification of evidence from the American Academy of Sleep Medicine (AASM; 2005). Imagery rehearsal applications rest on cognitive behavioral therapy (CBT) principles of modifying the distorted/dysfunctional thoughts through structured procedures, and in this particular case of IRT, the procedures include rescripting the nightmare/dream scenario.

Aurora et al. (2010) has included other nonpharmacological treatment options for nightmare disorder, but these other recommendations are cited at Levels B or C. In other words, Aurora et al. has listed IRT as the only Level A recommendation in the range of interventions, which otherwise includes exposure, relaxation, and rescripting therapy (ERRT, Level C); self-exposure therapy (SET, Level C); sleep dynamic therapy (SDT, Level C); systematic desensitization (Level B); progressive deep muscle relaxation (PDMR, Level B); hypnosis (Level C); and testimony method (Level C). Essentially, the recommendations are taken from the AASM (2005) that commissioned a task force to assess the literature on the treatment of nightmare disorders.

# The Evidence for EMDR Therapy Treatment of Nightmares

Specifically and relevant to this case study is the listing of EMDR therapy at Level C, which refers to the consideration of studies at Evidence Levels 3 and 4 (case control studies or case series or poor case control studies or poor cohort studies). Level C merits a recommendation that may be considered as a treatment option, with the assessment supported by low-grade data without the volume to recommend a higher level.

Specific research that merits a Level C recommendation for EMDR therapy and cited in Aurora et al.'s (2010) article are based on two Level 4 studies by Raboni, Tufik, and Suchecki (2006) and Silver, Brooks, and Obenchain (1995). Raboni et al.'s study reported on seven subjects who had nightmares and PTSD symptoms for at least 3 months after being assaulted or kidnapped. EMDR therapy improved PTSD symptoms and quality of sleep after five sessions. Raboni et al.'s study did not probe the quality and frequency of nightmares in these patients but addressed recurrent nightmares as part of sleep quality which showed significant improvement. Silver et al.'s case series of 83 veterans with PTSD compared EMDR therapy with relaxation training and biofeedback at intake evaluation, hospital admission at 2 months, and 90 days after admission. It was found that the EMDR therapy subjects showed better performance than the controls and the other two treatment groups in all variables including nightmares.

Although there has been a wealth of data about pharmacological and behavioral interventions for the treatment of nightmare disorder, it is a little disconcerting that much of the data surrounding the efficacy of EMDR therapy in the treatment of nightmares is not at the level of randomized controlled trials and Level 1 studies (high-quality randomized controlled clinical trials with narrow confidence levels) as stipulated by the AASM (2005). This study does not add to the range of Level 1 studies and is beset by the same problems that make EMDR therapy a less viable option as compared to IRT. For example, there is a paucity of research with trials directly comparing EMDR therapy with various pharmacotherapy and behavioral interventions as well as combination treatments with medication and psychotherapy.

Despite the present lack of good evidence base surrounding EMDR treatment of nightmares, this author is of the persuasion that there are, nonetheless, common features between EMDR therapy and IRT for EMDR therapy to be considered at the same level of evidence efficacy as IRT. Although IRT mediates a cognitive shift through the rehearsing of a new positive dream scenario, EMDR therapy installs the positive cognitions after the desensitization to tap into an adaptive network of positive cognitions. EMDR therapy also shares elements of desensitization with IRT and provides a structure to probing progress in anxiety ratings with repeated recalls of the traumatic distressing scenarios. The collection of EMDR therapy scripts by Luber (2010) has also listed a protocol for nightmare processing.

This study is an attempt to describe EMDR treatment of nightmare and highlights various aspects of EMDR therapy which has been helpful for the patient.

#### **Case Report**

The patient, a 36-year-old lady, was first seen in January 2013 for depression symptoms by the psychiatrist at the outpatient clinic of a hospital in Singapore. The depression was, in the main, caused by significant problems coping with the psychosocial stressor of caring for her 8-year-old son with autism spectrum disorder. In May 2013, the patient was subsequently referred to the psychologist—who is also the author of this article—to deal with her sleep difficulties. At the point of follow-up with the psychiatrist, the patient had reported a near "50% improvement" in depression symptoms, but her sleep disturbances persisted, hence the referral to the psychologist.

Specifically, she had been having what she described as "nightmares" for a good 9 years in her 10 years of marriage. The content of the nightmares was related to concerns over her husband's supposed extramarital affair, and although she acknowledged that the concerns were the "total opposite of reality," she continued having the nightmares despite awareness and knowledge that her husband had not strayed from their marriage commitments. The other aspect of the nightmares was related to "her son going missing after misbehaving in school." In her nightmares, she saw herself punishing her son for his misbehavior at school, and then he would run away from home. The interesting aspect of the two nightmares related to her husband's infidelity and son's misbehavior was that they would be repetitive, between four and five nights in a typical week. Frequently, she would find herself waking up in the middle of the night, close to the breaking of dawn, with the horror and fear of the nightmare. The consequences of the sleep disturbances or mid-sleep awakenings were that her concentration and mood levels were affected in the daytime. Specifically, she found herself easily irritated, depressed, and stressed over minor incidents and encounters with her son.

#### Measures

#### **Outcome Rating Scale**

The Outcome Rating Scale (ORS) is part of a change outcome management system developed by Miller and Duncan (2004). The ORS contains 4 items and is a self-report, visual analogue scale that is available in computerized, written, and oral forms. It was developed as a measure to track the progress of clients during therapy across three main areas of client functioning: interpersonal relations, symptomatic/individual functioning, and performance in social roles (Miller & Duncan, 2004; Miller, Duncan, Brown, Sparks, & Claud, 2003). On the visual analogue scale, clients are asked to mark on a 10-cm line their respective levels of functioning, with high ranking (good ratings) toward the right and low (poor ratings) to

#### A.S.I.S.T. for Agencies

A computer-based version of the ORS is used with the patient, which includes the administration, scoring, interpretation, and data storage tool (ASIST; Elliot et al., 2007). This program provides a comprehensive and practical means of administering, scoring, and interpreting ORS scores in the session. If access to a computer was not available on that day, therapists could use paper version of the ORS, with the scores subsequently inputted into the ASIST program.

#### Procedure

At the beginning of the session, the patient was provided with an information sheet outlining the study and the use of the ORS. The patient was invited to ask any question she had regarding the study and to sign a consent form if she agreed to participate. A client debriefing sheet was provided to the patient at the end of the first therapy session.

#### Treatment

The patient was seen over four sessions; the first three sessions were undertaken on a biweekly basis, with the final fourth session conducted 1 month after the third session. All the sessions were for 1 hour.

Following the scripted protocol provided by Luber (2010) about treating nightmare images as part of the targeting sequence for memories, the nightmares were processed accordingly as per standard EMDR protocol. The first target memory was chosen as the scene in which her son was bullied by his cousins and subsequently ran out of the door. The targeting sequence was set up with negative cognition (NC) of "I am useless" and desired positive cognition (PC) of "I can learn to help my son deal with the situation," with a validity of cognition (VOC) of 6/7. The emotions elicited were fear, and subjective units of distress (SUDs) were at 8/10. Some feelings of tightness were located in the chest area. Desensitization was done with bilateral stimulation through the use of eye movements, but processing was incomplete in the first session. Two weeks later in the second session, the patient reported that she noticed that the dreams

that she was having were no longer so "intense or disturbing." The nightmare image of her "son being bullied by cousins and subsequently running out of the door" was no longer an aspect of the dream content as well. This is surprising because noticeable improvement was in a matter of a few weeks, although processing in the desensitization phase was incomplete in the previous session.

In the second session, the decision was made to process another target image because the previous target memory/nightmare image was no longer present in her dreams. The next target memory surrounded the theme of her husband's (supposed) affair, with the nightmare scenario of "husband talking to another woman, laughing, and chatting away while she is taking care of her son who is throwing a tantrum." The NC was located in "I cannot trust anyone," with desired PC of "I can learn to trust my loved ones" at a VOC of 4/7. Pairing off the NC with the target scene/ memory brings on a feeling of disappointment on an SUDs level of 8/10. She moved down the channel of associated memories with her NCs as an anchor, eventually hitting a touchstone memory that revealed disappointment with her father for continually breaking his promises. She also moved to other related memories, anchored by her feelings of disappointment, and reprocessed a recent significant image/ memory related to "I was the only one in the house with a high fever and wishing that my husband would be around, with the hopeless feeling of him not being there when I need him most." Once again, the processing was incomplete in the second session, and going back to target memory showed an SUDs value of 4/10.

In the third session, the patient reported that the dreams were still present, but they no longer affected her sleep. There was no sleep disturbance in the 1 week preceding the therapy, and considering the context of her baseline of frequent sleep disturbances in the past 6 years, this represented, from the patient's perspective, considerable and significant progress. The patient also explained that the dream content has changed to more routine events of "coaching her son in his homework" without the disturbing elements of him running out of the house. Her husband who accompanied her to the present session was pleasantly surprised by her improvement and noted that she would no longer wake up in the middle of the night shouting and arguing (with her husband in a dream). The target memory of her husband's infidelity was incompletely processed in the second session, but the same target memory was evaluated and processed with an SUDs rating of 0/10 in the third session, with

a full VOC of 7/7 in the presence of a PC of "I can learn to trust my loved ones" after several sets of bilateral stimulation. Because of the considerable progress that the patient made in the three sessions, the patient was discharged from psychological care and given an open appointment.

Subsequent checks with the clinician–doctor also indicated that she has made considerable progress with no further sleep disturbances. These checks were done 1 month, 3 months, and 5 months after her discharge from psychological care.

#### Results

The patient demonstrated ORS scores which were consistent with her reported progress. In the first session, she indicated an ORS score which was in the clinical range (score = 24/40), progressing to 39.5/40 in the second session before providing a final score of 39.5/40 in the third session. A higher score indicates better levels of functioning, with an ORS score higher than 36/40 as a cutoff indicative of progress in the nonclinical range. Specifically, the patient has moved into the nonclinical range of functioning by the second session and maintained her progress into the third session.

#### Discussion

This case study distinguishes itself by being the first article to be featured from Singapore. EMDR therapy has a relatively short history in Singapore, with EMDR Singapore only being established in July 2010. The EMDR therapy community has grown in Singapore to include about 100 members, of which 30 are active EMDR therapy practitioners. There are also 5 practitioners who have attained facilitator status with EMDR Institute, with ongoing efforts to have certified trainers and consultants from the ranks of the EMDR Singapore community. A discussion with key members of the Singapore community has indicated that the adherence to a set of scripted protocols in EMDR therapy procedures has essentially translated to an ease of applicability across different clients and cultures (Singapore is a pluralistic society represented by four ethnic groups). In fact, some researchers (Gelbach & Davis, 2007) have noted that EMDR therapy has adapted well in diverse cultural environments. Although practitioners appreciate the standard protocols and the ready translation to clinical situations, there is also a growing awareness of process and cultural issues. The standard protocol works well for clear-cut and time-limited events. Sometimes, clients may move through node after node of distressing memories without completely clearing the traumas and distresses related to their individual and cultural difference.

One of the reasons this client may have been able to clear her traumatic memories relatively quickly and essentially in three sessions is because of the strong familial orientation of the PCs. The two PCs-"I can learn to help my son deal with the situation" and "I can learn to trust my loved ones"-connote a collectivistic response with hues of community and family ties. Indeed, studies looking at Asian and White American profile comparisons (e.g., Bond, 1991; Sue, Keefe, Enomoto, Durvasula, & Chao, 1996; Sue & Sue, 1990) have commented that Asians in the United States are more likely to hold values and engage in behaviors that display a collectivistic and familial orientation, which include respect for elders, deference to authority figures, concern for loss of face, interpersonal harmony, and strength in community living. It is this author's recommendation that the self-referential schemas taught and espoused in standard protocols as a reference for NCs and PCs can be adapted with a collectivistic orientation for the Asian client.

Process issues are important, especially in patients with dissociative disorders or complex presentations. Potential process issues in complex presentations include patient's or client's willingness to work with certain images and scenarios, countertransference in the context of therapist triggering certain traumatic memories, ongoing triggers in the environment that prevent the recall of a safe place and re-traumatization concerns, looping because of the inconsistency between the cognitions and memories, as well as misalignment between the NC/PC structure. Regarding this patient, there were no process issues. In fact, the issues were straightforward for this patient mainly because the NC is clearly defined and aligned to the core memory structure which is related to the nightmare scenario. The targeting sequence is easily established, with the targeted memory consistent with the NC/ PC structure and surrounding the theme of "helplessness." In the case of this client, it was not necessary to run the gamut of cognitive interweaves to help the client get to a VOC of 7.

As noted earlier, this study does not add to the spectrum of randomized controlled trials that would make EMDR therapy at the same level as a Level 1 study stipulated by the AASM (2005) and on par with IRT which has been recognized for its efficacy in the treatment of nightmares. A Level 1 study would require high-quality randomized controlled clinical trials with narrow confidence levels, and it is important to note that the most meaningful contribution by Krakow, Hollifield, et al. (2001) to Aurora et al.'s (2010) survey of IRT studies included 138 women with PTSD-associated nightmares. However, this study may merit recommendation at Level 4, which, based on Aurora et al.'s criteria, would comprise case reports, case series, or poor case control studies. Indeed, the two studies cited by Aurora et al. for EMDR therapy efficacy—Raboni et al. (2006) and Silver et al. (1995)—are at Level 4 as well. A survey of literature also showed most EMDR-based studies for the treatment of nightmares are at Level 4 and are usually case reports (e.g., Anchisi, 1995; Pellicer, 1993). Although this study does not add to the range of Level 1 studies, this is also a call for researchers to include randomized controlled trials as part of the design so that EMDR therapy can be placed on par with IRT for its efficacy for the treatment of nightmares.

In conclusion, this case study has reflected the use of EMDR therapy in its applications to a patient with traumatic memories and sleep disturbance. The ready improvement and gains of this patient has served to highlight various aspects of the procedures which have worked well for the client, which includes targeting the NCs surrounding the theme of helplessness as well as adapting the PC with a collectivistic orientation.

#### References

- American Academy of Sleep Medicine. (2005). *The international classification of sleep disorders: Diagnostic and coding manual* (2nd ed.). Westchester, IL: Author.
- Anchisi, R. (1995). L'eye movement desensitization nel trattamento degli incubi: Presentazione di un caso [The eye movement desensitization in the treatment of nightmares: Case presentation]. *Psicoterapia Cognitiva e Comportamentale*, 1(1), 45.
- Aurora, R. N., Zak, R. S., Auerbach, S. H., Casey, K. R., Chowdhuri, S., Karippot, A., . . . Morgenthaler, T. I. (2010). Best practice guide for the treatment of nightmare disorder in adults. *Journal of Clinical Sleep Medicine*, 6(4), 389–401.
- Bond, M. H. (1991). Chinese values and health: A culturallevel examination. *Psychology & Health*, 5(2), 137–152.
- Elliot, D., Brown, J., Miller, S. D., & Duncan, B. L. (2007). ASIST for agencies—Using the Outcome and Session Rating Scales (ORS/SRS. Version 3.06) [Computer software]. Santa Cruz, CA: Author.
- Ferini-Strambi, L., & Fantini, M. (2008). Sleep and quality of life in REM sleep parasomnia. In J. C. Verster, S. R. Pandi-Permual, & D. L. Streiner (Eds.), *Sleep and quality of life in clinical sleep medicine* (pp. 119–126). Totowa, NJ: Humana Press.
- Forbes, D., Phelps, A., McHugh, A., Debenham, P., Hopwood, M., & Creamer, M. (2003). Imagery rehearsal

in the treatment of posttraumatic nightmares in Australian veterans with chronic combat-related PTSD: 12month follow-up data. *Journal of Trauma Stress*, *3*(16), 509–513.

- Gelbach, R. A., & Davis, K. E. B. (2007). Disaster Response: EMDR and Family Systems Therapy under Community wide Stress. In F. Shapiro, F.W. Kaslow, & L. Maxfield (Eds.), *Handbook of EMDR and family therapy processes* (pp. 387–404). Hoboken, NJ, US: John Wiley & Sons Inc.
- Germain, A., & Nielsen, T. (2003). Impact of imagery rehearsal treatment on distressing dreams, psychological distress, and sleep parameters in nightmare patients. *Behavioral Sleep Medicine*, 1, 140–154.
- Krakow, B., Johnston, L., & Melendrez, D. (2001). An openlabel trial of evidence-based cognitive behavior therapy for nightmares and insomnia in crime victims with PTSD. *American Journal of Psychiatry*, 158, 2043–2047.
- Krakow, B., Melendrez, D., & Johnston, L. (2002). Sleep Dynamic Therapy for Cerro Grande Fire evacuees with posttraumatic stress symptoms: A preliminary report. *Journal of Clinical Psychiatry*, *63*, 673–684.
- Krakow, B., & Zadra, A. (2006). Clinical management of chronic nightmares: Imagery rehearsal therapy. *Behavioral Sleep Medicine*, 4, 45–70.
- Krakow, V., Hollifield, M., & Johnston, L. (2001). Imagery rehearsal therapy for chronic nightmares: With a thirty month follow-up. *The Journal of the American Medical Association, 286, 584–588.*
- Lancee, J., Spoormaker, V., Krakow, B., & van den Bout, J. (2008). A systematic review of cognitive-behavioral treatment for nightmares: Towards a well-established treatment. *Journal of Clinical Sleep Medicine*, 4, 475–480.
- Leung, A. K., & Robson W. (1993). Nightmares. Journal of National Medical Association, 85, 233–235.
- Luber, M. (2010). Eye movement desensitization and reprocessing (EMDR) scripted protocols: Special populations. New York, NY: Springer Publishing.
- Miller, S. D., & Duncan, B. L. (2004). The Outcome and Session Rating Scales: Administration and scoring manual. Chicago, IL: Institute for the Study of Therapeutic Change.
- Miller, S. D., Duncan, B. L., Brown, J., Sparks, J. A., & Claud, D. A. (2003). The Outcome Rating Scale: A preliminary

study of the reliability, validity, and feasibility of a brief visual analogue measure. *Journal of Brief Therapy*, *2*, 91–100.

- Pellicer, X. (1993). Eye movement desensitization treatment of a child's nightmares: A case report. *Journal of Behaviour Therapy and Experimental Psychiatry*, 24(1), 73–75.
- Raboni, M., Tufik, S., & Suchecki, D. (2006). Treatment of PTSD by eye movement desensitization reprocessing (EMDR) improves sleep quality, quality of life, and perception of stress. *Annals of the New York Academy of Sciences*, 1071, 508–513.
- Ross, R., Ball, W., Sullivan, K., & Carroff, S. (1989). Sleep disturbance as the hallmark of posttraumatic stress disorder. *American Journal of Psychiatry*, 146, 697–707.
- Shapiro, F. (1989a). Efficacy of the eye movement desensitization procedure in the treatment of traumatic memories. *Journal of Traumatic Stress*, *2*, 199–223.
- Shapiro, F. (1989b). Eye movement desensitization: A new treatment for the post-traumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 20, 211–217.
- Shapiro, F. (2001). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures (2nd ed.). New York: Guilford Press.
- Silver, S., Brooks, A., & Obenchain, J. (1995). Treatment of Vietnam War veterans with PTSD: A comparison of eye movement desensitization and reprocessing, biofeedback, and relaxation training. *Journal of Trauma Stress*, 8, 337–342.
- Sue, S., Keefe, K., Enomoto, K., Durvasula, R., & Chao, R. (1996). Asian American and White college students' performance on the MMPI-2. In J. N. Butcher (Ed.), *International adaptations of the MMPI: Research and clinical applications* (pp. 206–220). Minneapolis: University of Minnesota Press.
- Sue, D. W. & Sue, D. (1990). *Counselling the culturally different: Theory and practice* (2nd ed.). New York: Wiley.

Correspondence regarding this article should be directed to Dr. Matthew Woo, The Resilienz Clinic, 10 Sinaran Drive #10-30, Novena Medical Center, Singapore 307506. E-mail: matthew\_woo@resilienz.com.sg
# **Compassion-Focused EMDR**

Angela Kennedy

Tees, Esk and Wear Valleys NHS Foundation Trust, Lanchester Road Hospital, Durham, United Kingdom

Compassion-focused therapy was developed to enhance physiological systems related to well-being, safeness, and connectedness in people where shame and self-criticism inhibited progress in therapy (Gilbert, 2000; Gilbert & Irons, 2005). This system links attachment experiences with emotion regulation capacities, with integrative capacities of the mind and also with the interplay between different motivational systems, which are played out in multiple self-states (Cortina & Liotti, 2010; Cozolino, 2010; Gilbert, 2009; Liotti & Gilbert, 2011). Hence, a compassionate focus could potentially prove valuable in eye movement desensitization and reprocessing (EMDR), particularly where shame or attachment trauma is involved or for those traumas that have impacted on the structure of the self, for example, dissociation. A structured compassion-focused EMDR (CF-EMDR) seems likely to be particularly useful for therapists wishing to pay positive attention to strengths and well-being. The primary task of the CF-EMDR therapist would therefore be to facilitate a warm and wise relationship to the problems that brought the person to EMDR. This article outlines the potential benefit of a compassionate focus in the processing phases of EMDR to address self-critical blocks, giving clinical examples in tables to illustrate the process and language.

**Keywords:** compassion; shame; eye movement desensitization and reprocessing (EMDR); self-criticism; trauma; therapy

ompassion is a felt experience relating to sympathy that motivates people toward need or distress and is demonstrated by care-giving behaviors (Gilbert, 2009, 2010). It is generated from a sensitivity to suffering and a motivation to do something active to help that suffering (Dalai Lama, 2005). Humans are social animals with evolved systems of attachment and social behaviors which enhance our survival (Cortina & Liotti, 2010). Such survival is linked to compassionate behavior that evolved to enhance cooperation, which protects others within a social network (Goetz, Keltner, & Simon-Thomas, 2010). Compassion may manifest in thoughts, an emotional state, bodily experiences, and behavioral impulses. MacLean (1990) developed the idea of the evolved triune brain that demonstrates the central position of care-related motivations in our psychology. The reptilian brain is the oldest and controls arousal and drives and is responsible for basic threat defenses and ranking in the group. The mammalian brain mediates emotion, attachment motivation, and memory and is governed by the limbic system, which

lies over the reptilian brain. The neocortex is responsible for self-conscious awareness, abstract ideas, planning, and accessible thought processes and is the most recently evolved aspect of the human brain. It likely evolved in conjunction with our complex social systems (Gilbert, 1989; Irons & Gilbert, 2005; MacLean, 1990). Although many motivational systems are concerned with resources, survival, reproduction, or exploration, a compassionate motivation is linked to archetypal influences over our behavior in social situations (Gilbert, 1989, 2007). These social motivations include the capacity to give and receive care, both to oneself and others.

Depue and Morrone-Strupinsky (2005) found two types of positive emotion. One was related to caregiving, affiliation, and social safeness, whereas the other was related to agency and pleasure. Compassion is linked to emotion regulation through good, safe, affiliative experiences. Such attachment experiences are highly related to soothing capacity, persons' mindfulness of their own mind, and their ability to appreciate the motivations of others (Bateman & Fonagy, 2012). These abilities have evolutionary advantages to enable survival and social functioning and bring out innate strengths (Belsky & Pluess, 2009; Bowlby, 1980; Cortina & Liotti, 2010; Whitehead, 2001).

Experiencing the behavior of others teaches us how we are perceived by them and this in turn influences what we think of ourselves (Bateman & Fonagy, 2012). Loving relationships create a sense of self-worth through internalized expectations of patience and kindness. Self-compassion is about self-acceptance, which directs kindness and support toward the self even when faced with challenges (Neff, 2003a). It encourages reflective capacities about oneself and others. Compassion-focused therapy has an emphasis on affiliative-based soothing because internal models of positive relationships can downregulate threat even in the imagination. Such neurobiological soothing capacities can engage with suffering rather than avoid it and build resilience by moderating the brain's threat-based alarm system (Germer, 2009; Gilbert, 2009; Siegel, 2010).

# Impact of Trauma on Compassion

The capacity to be sensitive to suffering and the motivation to facilitate well-being are connected to a sense of belonging and secure safe relationships (Gilbert, 2009). Such social conditions create internal capacities to regulate emotion and the ability to trust in others for support, which can mitigate against the impact of any traumatic event (Schore, 2012). Trauma and our response to it may provoke two types of social fears in addition to any fears regarding physical safety (Gilbert, 1998). The first type is externally focused on how we are perceived by others and is closely linked to lack of trust in others and paranoia (Matos, Pinto-Gouveia, & Gilbert, 2013). External fears can contribute to posttraumatic difficulties through expectations of punishing or rejecting attitudes from other people and changes in social behavior which are linked to one's position within the social hierarchy and sense of belonging. Compassion and well-being are then further inhibited by threat, shame, and isolation, which allow other motivations, such as competition or cruelty, to emerge instead.

In addition to externally focused social fears, trauma can lead to a negative internal relationship with the self, dominated by shame and self-criticism. Such internally directed anxieties about the self can inhibit therapeutic progress by undermining the persons' confidence, criticizing their efforts, cutting them off from sources of support through appraisals of worthlessness, and creating additional layers of emotional dysregulation. Trauma and suffering have the potential to provoke personal growth (Tedeschi & Calhoun, 2004). However, sometimes life's challenges can have a negative impact on compassion as demonstrated in three levels of information processing corresponding to the triune brain: cognitive, emotional, and sensorimotor (Wilber, 1996).

## Self-Critical Cognitions

A cognitive theory developed by Ehlers and Clark (2000) proposed that trauma experiences can be appraised in a self-critical manner, and this critical appraisal can become a primary organizing principle for the impact of the trauma. In posttraumatic stress disorder (PTSD), previously held assumptions about the world may have been shattered. In attachment trauma, the assumptions made about the world and self are inherently problematic from the start and later, trauma simply confirms them (Allen, 2013). Such cognitions are emotionally disabling by their impact on self-worth and sense of efficacy (Tracy, Robbins, & Tangney, 2007). Meta-analysis of research using the self-compassion scale showed that critical judgements about the self were strongly associated with psychological disorder (Neff, 2003b). Compassion-focused therapy initially evolved out of cognitive behavioral therapy as issues of social comparison, shame-based cognitions, and *tone* of alternative appraisals began to be understood (Gilbert, 2014). It is notable that people can feel threatened by their own self-critic, which may manifest as depressive thoughts or psychotic voices (Gilbert et al., 2001). Self-criticism can be functional when it is safer than blaming the parent on whom you are reliant even if that person is abusive (Bowlby, 1980; Gilbert & Irons, 2005). Therefore, abuse-related dominance-submissive patterns may be played out internally in relation to the self. A nonjudgmental but assertive stance toward unwanted thoughts or memories is likely to be more helpful than internal criticism or hatred toward those aspects of self-experience. The person can begin to find ways of engaging with those challenging parts of themselves with a calmer, kinder attitude. Destructiveness can then be contained and managed so that their origins or functions can be understood. Such attitudes reflect true wisdom (Meeks & Jeste, 2009).

#### Shame

Shame is the appraisal of the self as worthless and bad. It elicits hypoarousal and a motivation to hide from others, attack others or the self, and avoid internal experience and self-knowledge (Gilbert, 1998; Nathanson, 1987). Avoidance of unwanted aspects of internal experience can lead to a phobia or lack of containment of some self-states, and trauma memories may become compartmentalized away from the core self and contribute to the maintenance of PTSD or dissociative disturbance (Steele, van der Hart, & Nijenhuis, 2005).

Gilbert (1998) describes "internal shame" as that which is directed from the self to the self. "External shame" is that expected from other people. Shame can be particularly an issue for people who have experienced early attachment trauma or abuse (Herman, 1997), and shame can have a role in PTSD as well as fear (Harman & Lee, 2010; Lee, Scragg, & Turner, 2001). As social animals, extreme social emotions caused by neglect, abuse, isolation, bullying, and others can be as psychologically damaging as a threat to life (Fonagy, 1996; Gilbert, 1998; Herman, 2011), and shame memories can act as trauma memories (Matos et al., 2013). However, shame memories exceed being feelings and beliefs; they are held as procedural (i.e., automatic) memories of patterns of relating (Allen, 2013), which may often involve submission to negative appraisals (Gilbert et al., 2001). Such shame-based fear of compassion and difficulties in attachment style have been implicated in a range of emotional issues (e.g., Gilbert, McEwan, Matos, & Rivis, 2011).

# Impaired Self-Soothing and Emotional Regulation

Liotti and Gilbert (2011), Fonagy (1996), and many other developmentally based researchers describe how people cannot learn to emotionally regulate in the same way as they learn facts. Social encounters can soothe us when in distress, and it is through repeated experiences of such support that people can come to learn to sooth and emotionally regulate themselves in an automatic and implicit way (Fonagy, Gergely, & Jurist, 2003; Germer, 2009; Gilbert, 2009; Schore, 2012; Siegel, 2010). Babies begin their lives experiencing extreme and unintegrated bodily sensations (Allen, 2013). Allen (2013) states "integration of disparate experiences is a developmental achievement, and such integration rests on a mentalizing infant-caregiver relationship in which the caregiver holds the infant's mind in mind" (p. 82). There is much evidence from the child development literature that demonstrates the important ongoing role that attachment figures have in helping us tackle challenges and anxieties in life. For example, Sorce, Emde, Campos, and Klinnert (1985) showed that infants who saw an encouraging figure at the other end of a visual cliff felt enabled to

walk across transparent Perspex and overcome any uncertainty about the apparent drop beneath them. Infants whose mothers looked afraid did not move across the Perspex because they were signalled of danger. Compassionate internalized representations of self and other can therefore give us courage to approach problems and fears. Interpersonal trauma, however, compromises the development of emotion regulation capacities (Schore, 2012; Siegel, 2010) and the capacity to integrate various aspects of experience (Liotti & Gilbert, 2011). Gilbert (2009) describes how there can follow an escalation of difficulties because when the soothing system is compromised by threat, less caring impulses will emerge. Such behaviors shut out possible sources of reparative emotional support.

## **Compassion-Focused Therapy**

Compassion-focused therapy (CFT) engages each client toward caring for his or her own well-being and pays particular attention to the emotional tone of self to self relating during the therapeutic process (Gilbert, 2009, 2010). It facilitates a mindfulness to the person's own needs and addresses adaptive emotional processing by harnessing a warm, wise, and nonjudgmental appreciation of the client's own predicament. That is, experiencing the process with "affiliative emotion" (Gilbert, 2014). It may do this by including imagebased skills training and then using that to address attachment-based fears, learnt survival strategies regarding self-care, and emotional conditioning (Gilbert & Irons, 2005).

# Theory Underlying Compassion-Focused Therapy

The neurobiological model of CFT sees key anxieties as emerging from the interaction between the life history of the person and the "tricky" nature of our evolved brains (Gilbert, 2000, 2009, 2014). Traumatic memories are tagged by the brain's threat-based alarm system, called the amygdala, as emotionally significant (Steel, Fowler, & Holmes, 2005). In addition, complex subsystems in the brain unconsciously record expectations regarding social experiences (Fonagy, 1996; Siegel, 2010). Such emotional learning brings about protective actions (Gilbert, 2000; Ogden, Minton, & Pain, 2006). Trauma and its impact on the amygdala compels us to act in particular self-protective ways, for example, fight, flee, freeze, collapse, cry for help, and appease. Such reactions will be represented in people's best efforts to cope and may unfortunately have unintended consequences which reinforce the key fears and impulses (Gilbert, 2009). The CFT model

uses the soothing and drive systems (Depue & Morrone-Strupinsky, 2005) to moderate threat responses and facilitate emotional recovery. Compassion is an *active* engagement with suffering motivated *toward* well-being (Gilbert & Choden, 2013).

# Research Studies on Compassion-Focused Therapy

The CFT model has been used successfully with a range of different presentations including psychosis (e.g., Gumley, Braehler, & Macbeth, 2014) and eating disorders (e.g., Goss & Allan, 2010). Its application to PTSD and emotionally unstable personality difficulties shows the effectiveness of harnessing the power of compassionate motivations and skills in managing trauma-related conditions (Beaumont, Galpin, & Jenkins, 2012; Lee, 2012; Lucre & Corten, 2012).

# Eye Movement Desensitization and Reprocessing

Eye movement desensitization and reprocessing (EMDR) is an established treatment for trauma-related issues (Shapiro, 2001), with strong evidence for its efficacy in the treatment of PTSD (Bisson & Andrew, 2007; Maxfield & Hyer, 2002). The theory underlying EMDR posits that when a memory of a disturbing event is inadequately processed, neural networks can hold related perceptions, emotions, bodily sensations, and cognitions in a state of potential activation similar to the time of the event. EMDR therapy was developed to process disturbing memories and to address associated bodily sensations of distress, beliefs, triggers, maintenance factors, and skills needed to enhance prospective functional behaviors. It uses bilateral stimulation to facilitate connections between neural networks and disparate streams of information processing, including more adaptive compassionate aspects of self (Shapiro, 2001).

# How EMDR Addresses Shame and Self-Criticism

There are many ways in which EMDR can already address issues of shame and dysregulation. The use of interweaves to address self-critical cognitions is part of standard processing (Shapiro, 2001). Parnell (1999) discusses how shame can be resolved by more emphasis on stabilization, a focus on symptom relief rather than memory retrieval, and addressing attachment issues with the therapist and others. Blore, Holmshaw, Swift, Standart, and Fish (2013) uses a blind therapist protocol to minimize provoking inhibiting levels of external shame while targeting memories. This trains the client to monitor his or her own change so that the therapist does not need to know the details of the target image. Wesselmann et al. (2012) describes successfully using EMDR methods to address shame emerging from attachment experiences. This article is an attempt to outline another framework to address such issues.

## Integration of EMDR and Compassion-Focused Therapy

When integrating CFT and EMDR, Phases 3, 4, and 5 follow a typical protocol process, but the compassionate focus alters the content. This modification is described in the following sections and illustrated with clinical examples.

## During Phase 1

Engaging the client in EMDR is essential from the beginning, and the very presence of the clinician will alter what is observed in the client during the processing (Dworkin, 2005). However, EMDR may appear as if it is applied by one person to another (Dworkin & Errebo, 2010). The addition of intersubjective attunement can facilitate processing during EMDR, particularly if the nature of therapeutic relationship evolves over the different phases (Dworkin & Errebo, 2010). To take an example of a potential relational barrier, one of the expectations of EMDR is that clients are honest. Shame is a natural barrier to openness (Gilbert, 2009). In addition, clients with learned responses of submission may not be conscious of the ways that they seek approval from the therapist to avoid perceived disapproval or rejection. To deal with this, Dworkin (2005) states that EMDR therapists benefit from awareness of their own blocks and unresolved networks that may resonate with that of their clients. Such awareness prevents barriers emerging, which are cocreated by the alliance. CFT training involves much practice of the principles and techniques on the self so that one can have firsthand experience of the struggle our "tricky" minds have in dealing with competing motivations and the suffering of life (Gilbert, 2009).

Shapiro (2001) acknowledges the importance of unconditional regard and safety in therapeutic engagement, and Parnell (1999, p. 66) elaborates this by describing how the EMDR patient with attachment trauma could come to incorporate the kind presence of the therapist as a "positive self-object." Therefore, the therapeutic relationship may play a key role in transforming someone from a threat state to one of safeness. Because our brains are sensitive to social cues, how we experience the mind of the therapist can be a healing process in itself (Gilbert, 2007). We think and feel differently when in the presence of someone who we feel holds us in mind kindly to when we imagine they might condemn us.

CFT supposes that working with threat is not just a matter of reduction in negative arousal. Compassionate affiliations create a context not only for soothing but also for growth and well-being. CFT does not just process threat states and associated defenses, but it also stimulates oxytocin-based networks of safeness (Gilbert, 2009, 2013). In this way, it pulls resources from different adaptive networks toward the processing of threat. The evolutionary stance of compassion-focused therapists means they engage with clients from a position of shared humanity and innate principles, which is deeper than empathy. A warm and nonjudgmental stance is critical in CFT, although this in itself can trigger conditioned fears for those with relational trauma (Gilbert, 2007).

*Case Example.* A woman with postnatal depression had fears of hurting her child. She had a history of abuse, so the fears already appeared to make sense in terms of her experiences. However, as the therapy emerged, she was able to disclose that during her own abuse, she had been made to hurt another child. Such a disclosure may have been unlikely if the therapist had not been experienced by her as nonjudgmental.

#### During Phase 2

EMDR uses images in resource building, in particular, the "safe place." Resources are not always limited to a sense of physical safety (e.g., see Shapiro, 2001, p. 435). Dworkin (2005) describes his personal use of a movie character as a resource representing emotional resilience. Parnell (1999) uses nurturing figures, inner advisors, wise figures from history or culture, and positive memories. Recent attachment-based research would support such ideas. Imagery involving good internal attachment figures has the potential to regulate arousal. Mikulincer and Shaver (2007) found ways of encouraging patients to bring to mind secured attachment experiences. This had the effect of enhancing caregiving, improving self-worth, reducing distress relating to trauma, and even reducing attachment issues temporarily. Selcuk, Zayas, Änaydin, Hazan, and Kross (2012) used an experimental design to examine if recalling an attachment figure could help affect regulation after recalling an upsetting event. Bringing to mind a positive person in his or her life had an impact on both reported distress and im-

plicit measures of distress. It also lessened the amount of negative thinking that the person engaged in. CFT links people to emotion regulatory capacities through such imagery. Scripts for compassionate image work are documented in the CFT literature (e.g., Lee, 2012). The image can be an ideal self (perhaps based on a memory of when one has been kind to another), another archetypal being (such as a character from literature or a perfect nurturer), or a perceptual representation (maybe a color). Compassionate mind training has been demonstrated to be a useful resource to patients struggling with adversity (e.g., Gilbert & Proctor, 2006; Mayhew & Gilbert, 2008). Such research supports the use of compassionate images and an encouraging relationship toward oneself as resources during EMDR. Beaumont and Martin (2013) describe using such compassionate mind training successfully as a resource strategy in an EMDR case study. Resourcing the self is a precursor to processing in Phase 2 of EMDR protocols, for closing incomplete sessions and for resourcing future-focused targets (Shapiro, 2001). In this way, the resourcing of a compassionate self aids the engagement with a functional ego state characterized by wisdom, safeness, warmth, and authority. This wise and caring mental network elicits a supportive relationship toward oneself and one's problems. Having a compassionate self state is an additional resource that uses a specifically positive emotion system as a therapeutic way of bringing emotional regulation within the therapeutic window (Siegel, 1999). In keeping with EMDR resourcing, it allows the person the capacity to experience traumatized states with resources at hand but ones which are specifically tied to internalized soothing relationships (e.g., Lee, 2012). This can be further enhanced by using an object which is conditioned to the image or attachment/soothing memory to elicit embodied safeness. Such compassionate objects are more akin to transitional objects than grounding objects (Winnicott, 1953).

*Clinical Example.* The character that was chosen from a Japanese animation series (see Table 1) had "guardians" that reflected the person's own fragmented and dissociated self structure. However, the character was somewhat heroic and accepted as part of a desired social group. This helped the person create a narrative for accepting his or her fragments of experience as part of a whole. It also had wisdom and sociability that could guide the person to reflect on his or her life goals and patterns of illness behavior. The merchandizing around this character gave the person opportunity for objects that helped keep him or her on task between sessions.

History	Target Problem	Critical Fears	Compassionate Image	Compassionate Wisdom
Daughter died in accident	Depression	She is alone, so I am a bad mother for remaining alive.	Self as good mediator of conflicting needs in family; other was father who had died	She is cared for by my father in the sun and not cold and alone. It is understandable to feel torn loyalties, but I am a good mother needed by my family here.
Bullying by peers	Psychotic beliefs	The world is ending as punishment.	Tiger that embodies a quiet strength	I am safe and it was not my fault. My experiences have led to a lot of nameless dread which makes me believe terrible things are about to happen to the whole world because of me. I have practiced ways of dealing with this terror and know that when I do, these ideas do not take hold.
Abused as a baby	Medically unexplained abdominal pain	I am neglected and unlovable.	Japanese manga Animation character	I am worthy of care. I see that medi- cal staff are doing their best and intervention may make things worse. I can find ways of manag- ing the pain. I know there may be other causes for pain related to my history.
Uncertain memories of sexual abuse at age 3 years	Conspiracy anxieties	I am alone in the world. I am tainted.	Feminist character from novel	I have people now to support me. I can connect to others when I need to. I am a strong political woman whom people like. My quietness has its value, too.
Found person hanging during a walk	Flashbacks	I can't control my mind.	Ideal self	I can accept that I found the situa- tion challenging and that I can overcome this.
Child sexual abuse	Anxiety	I am bad.	Ideal self	It was not my fault.
Ritual abuse	Dissociative identity disorder	I am mad.	Sunlight	I have discovered the abuse was real. My dissociation has helped me survive.

TABLE 1.	Summary of Case Examples Using a Compassion-Focused Eye Movement Desensitization and
Reprocessi	ing Framework

#### During Phase 3

The negative cognition reflects the maladaptive selfassessment which accompanies an image (Shapiro, 2001). However, CFT would frame this differently to avoid negative judgments about the person's responses to threat. Compassion-focused EMDR may call this thought the *key fears of the inner critic*. It avoids language that may be perceived by the clients as suggesting their thought is "wrong" because it is very likely to be linked to attempts to make sense and protect oneself. It also defines the thought as one possible thought of the whole self. The therapist could ask, "What words go best with that experience that expresses your inner critic and deepest hidden fears?" The positive cognition has an important role in establishing a goal and stimulating neural processing. However, the CFT model of the mind incorporates the tonal quality of internal wisdom. The positive cognition in compassion-focused EMDR (CF-EMDR) may be slightly different from a "positive" one in that it would be framed within the "soothing" system (rather than "drive") to ensure it has warmth and connection inherent in it. In CF-EMDR, the positive cognition is reframed as *compassionate wisdom* using the mindset of the compassionate image to reflect on the thought, "When you bring up that picture (or feeling state), what would your compassionate self say about

the idea, remembering to use a supportive tone of voice toward yourself?"

#### During Phases 4 and 5

*Starting Phase Four.* When initiating the standard process of desensitizing the memory in Phase 4, the CF-EMDR therapist would use a slight adjustment to the words, reflecting the compassionate reframing of the negative cognition, "I'd like you to bring up that experience, the words of your inner critic (repeat the words), and notice where you feel it in your body. Now follow my fingers with your eyes."

Using a Compassionate Focus to Work With Abreaction. Focusing on bodily sensation is an important first-line method of addressing a block in EMDR (Shapiro, 2001). However, sometimes the arousal is so high or so low that the person is unable to process material or continue with bilateral stimulation. Shapiro suggests that manipulating the image during processing can limit abreaction (p. 179). CFT may look for ways to positively bring into the image something from the compassionate resourcing (Lee, 2012). Dworkin (2005) proposes that EMDR is enhanced by noticing when a client is outside of the therapeutic window and supports strategies to bring the client back to a state where processing can occur. Such strategies can give a capacity to return to the target so that it can be processed manageably in its original form.

Focusing on bodily sensation may be triggering in itself if the person is afraid of his or her own reaction. So, if the CF-EMDR clients become too unregulated, remind them to bring their attention to their compassionate resources. A key component of compassion as conceived within CFT is the courage to face and contain unwanted emotions and reactions (Gilbert, 2009). CFT elicits the soothing system, which holds positive strategies and networks for building containment and resilience.

*Case example.* One person told me of a slug-like "entity" which she felt on her leg. It was associated with terror and disgust. For a long time she thought it was some kind of nonhuman spirit that could do her harm. Compassionate resourcing helped her to face the fear enough to choose it as a target in EMDR. She realized that it represented an incident of sexual assault. She had previously interpreted a body memory as a concrete and current perception, making sense of it as best she could in the absence of a full picture. The memory of the assault had not been forgotten, but it had not been connected to this emotional memory and sense perception. Compassionate resourcing during sets of eye movements kept

the terror and delusional interpretation manageable, which enabled her to link the event memory with the bodily perception. This resulted in the delusion and the terror disappearing. The process of integrating such elements into the "self" is challenging for people, but the soothing system has an important role in facilitating integrative processes. Ultimately, to own an entity as representing part of one's life history recovers a sense of safety in the present.

Using a Compassionate Focus to Identify Feeder Memories Blocking Processing. The attention training in CFT is helpful to scan for other cues in the memory. Shame and its tendency to hide things away from view can be a critical block for processing, particularly with attachment-based trauma. CFT can support the disclosure of challenging or subconscious elements of experience that create shame of the self. Such shamebased feeder memories and their avoidance can be demonstrated to be functioning as trauma memories (Matos et al., 2013). Feeder memories are those early events that shape the development of the "self-critic" and fears of compassion or affiliations. Such memories often emerge spontaneously during processing sets (Shapiro, 2001, p. 190). They can also be elicited by such techniques as the "floatback" (Young, Zangwill, & Behery, 2002).

*Case example.* The woman with postnatal depression who disclosed about hurting another child when young experienced her own compliance with the abuser as shameful and traumatic. It had shaped her perception of herself as "bad" and made her fearful of becoming attached to others or submitting to the requests of others. Being able to identify and disclose this early memory was a turning point in therapy.

Using a Compassionate Focus to Work With Shame-Based Blocking Beliefs. Shame-based blocking beliefs are based around the global condemnation of the self, either from the person themselves or from others (Gilbert, 1998, 2000, 2009). They prompt emotional avoidance, withdrawal, and possible dissociation (Gilbert, 1998; Nathanson, 1987; Steele, van der Hart, & Nijenhuis, 2005). CFT has found that change is prompted by the tonal intention of such thoughts (Gilbert 2009, 2013). Such self-critical cognitions can then be addressed using a compassionate reframe, using the mindset of the compassionate image rather than the shamed, critical, or traumatized self-state.

Secondary gain from a client's current level of functioning may be to avoid the grief of accepting losses or the damage they have done. These and other blocks as well as protective behaviors can be understood as making sense and reframed as safety strategies within a CFT formulation. Their unintended consequences can often be shown to reinforce the original fear. This framework of understanding lessens the threat from awareness, which allows for some motivation toward change to emerge.

Case example. The woman with postnatal depression needed to develop a compassionate perspective toward herself as a child, which allowed them to understand why she submitted to the command to hurt someone else. There followed an outpouring of grief not only at the damage that had been done to that other child but also to that done to themselves when carrying around the shame and fear of one's own capacity. A compassionate tone was needed toward the image of them as a small child. However, this tone in itself triggered fears. The anxiously dismissive pattern of relating needed to be understood not only as protective from that event but also as coming at a cost of loneliness and isolation. Some work also needed to be done around her impulses of hurting others. The belief that she was a cruel and dangerous person needed evaluating with adult wisdom and kindness. The skills to contain such impulses also benefitted from the resilience of staying within a caring mentality.

Using Compassion-Focused Interweaves to Address Self-Care/Self-Respect. Compassionate interweaves may be required if the earlier strategies for dealing with blocks are not successful. Such strategies often require the therapist to introduce a new perspective. CFT works with organizing frameworks in the mind rather than beliefs on their own. A compassionate perspective is useful here in two main respects, although other areas may emerge as CF-EMDR develops. The first relates to the block against self-care or selfrespect. Compassion and connection are sometimes frightening for traumatized people because they are not protectively "on their guard." Such emotional loops or blocking beliefs can be addressed with compassion (see Table 2). Eliciting care toward the self and overcoming the learned resistances to such care are the main businesses of CFT (Gilbert, 2009).

Using Compassion-Focused Interweaves to Enhance Adaptive Processing. The second main use of a compassionate interweave is in the joining of different state-dependent networks. The person's internal compassionate resources can be used to regulate themselves when they have intrusive perceptions and when the processing becomes blocked in EMDR.

Component of Compassion	Block to Self-Care Because of Shame	Joining Different Networks
Attention	Ask, "What impact does this shame have on you/your life?"	Illustrate their inner conflicts and ego states and elicit a compassionate moderator.
Reasoning	Add some element of education from the compassion- focused therapy (CFT) model, for example, the evolved nature of our limited responses to threat and the importance of attachment in emotional regula- tion; link their conditioned response to how this was learned from experience; and refer to the formulation.	Ask, "What wisdom can your compassion- ate mind bring to bear on this feeling of shame?" or "What would your compas- sionate image say about this?"
Imagery	Ask them to think of a visual metaphor for what their "stuckness"/"critic" may look like.	Ask, "Can you picture your compassionate image alongside this distressing image?"
Behavior	The use of a method acting strategy to imagine them- selves in a compassionate social mentality.	Ask, "How is your inner critic/shame trying to protect you?" or "Notice the difference between the bodily impulses and posture in different frames of mind. What do you need to do differently right now?"
Motivation	Ask, "What would your fear be if we could remove your inner critic?" or ask, "What feeling is this critic direct- ing to you and does it have your well-being at heart?"	Ask, "What would your compassionate wis- dom say about this loop/critic?" or "How can you appreciate the conflict that you are in right now?"
Emotion	Ask them to return to soothing rhythm breathing, compassionate smile, and upright posture.	Ask, "What does your body need from your compassionate image to help you here?"

#### TABLE 2. Examples of Interweaves

Gilbert (2009, 2013) suggests that experiential divisions are typical of how the mind works. Clearly, acknowledging some degree of multiplicity in the self in terms of ego states has huge benefit in managing the relationship between a critical thought about the self or conflicts between states and a more "positive" or compassionate mindset. Such a view of the self allows the "compassionate" self to stay resourced while dealing with the target memories and states. It creates a distance from the traumatized elements so they no longer define the "self." Internal dialogue between a traumatized state and a state of compassion harnesses the conversations that someone has in their mind which others cannot hear (Fernyhough, 1996). Again, this model of the mind is consistent with adaptive information processing (AIP) of different neural networks, and an interweave will help prompt the persons' own intuitive wisdom as represented by their compassionate self state. The wise mind of this state will aid generalization of processing and break cycles of looping regarding emotional material (see Table 2).

*Phase 5: Case Examples of Installation.* The compassionate wisdom that has emerged during the sets of bilateral stimulation can be installed after the subjective units of distress (SUDs) to the target have reduced to zero.

The ideal self of the person who had flashbacks after discovering a suicide changed somewhat during sets (see Table 1). Initially, they were primarily courageous and resilient. However, as the sets progressed, it became clear that acceptance of some vulnerability was needed. It is not always possible to control the contents of our minds, and this is one of the universal wisdoms that CFT uses to generate to show how our brains work (Gilbert & Choden, 2013). This client learned that his or her mind could be as unruly as other people's and that it was not his or her weakness that led to the flashbacks but rather the fear of loss of control. Embracing this meant the suicide did not remain in potential activation of threat. A compassionate stance enhanced conditions for the possibility of growth toward more self-care and also less contempt for perceived "weakness," whether in themselves or others. The installation therefore helped toward posttraumatic growth.

#### During Phase 6

Compassionate bodywork involves learning to recognize what postures and activities ground and center the person. Breath and bodywork, image work, and the internalization of constructive relationships all contribute to the strengthening of soothing internal representations (Germer, 2009; Gilbert & Irons, 2005). Many therapies already use such mindfulness and sensorimotor attention. The difference is the primacy of the compassionate intention to be warm and accepting toward the experience of the body. Compassionate body scans are described by Gilbert and Choden (2013, pp. 203–205) as including both awareness of the sensations and tolerance of them. It is the second element that harnesses compassionate motivations, which are important to be present with warmth. Relating to the body with compassion opens the soothing system, which brings with it a capacity to contain and integrate experience (e.g., Gilbert & Choden, 2013; Schore, 2012).

# During Phase 7

Shapiro (2001, p. 167) suggests closing sessions after ensuring that clients are in a positive state of mind and safe enough to return home. CFT uses strategies to regulate emotion that do more than reduce threat in the body. They are positive strategies for a bodily experience of well-being. These can be achieved through the kind of image work outlined for Phase 2 but also by the practice of soothing rhythm breathing (Gilbert, 2009; Gilbert & Choden, 2013). Soothing rhythm breathing is a way of finding a calming rhythm which is usually slower than routine breath, and hence, it harnesses the body's natural mechanism to downregulate arousal. This, too, can be part of Phase 2 when patients are helped to stabilize themselves (Gilbert, 2009; Lee, 2012) but is usefully employed at the end of an incomplete session in lieu of a safe place in the standard protocol.

CFT can add practice at home. This might include nonjudgmental journals about their daily practice of compassion. This practice may be image work, breathing, thought journals, or gratitude journals. What this is intended to do is first to shift the focus of attention from threat to something supportive, in particular, their caregiving motivation toward themselves. Second, it reinforces that effort and practice are required to build a sense of safeness and healthier inner relationships.

## During Phase 8

Such homework or therapeutic attunement can illustrate the nature of the fears, blocks, and resistances to compassion and recovery. These issues need to be worked through using standard EMDR phases. However, CFT acknowledges that such blocks are inevitable when working with attachment traumas because of the fears that became conditioned to care, dependency, and closeness. The language of CFT would seek to accept such "blocks" into a broader understanding of the nature of our brains. Its focus on strengths and resilience building suggests CFT could be particularly helpful for work on dealing with future anxieties and assimilation into a satisfying life. There are scales and questionnaires that can help show changes in the clients' fears and selfcompassion (Gilbert et al., 2011; Neff, 2003b). Otherwise, discussion of changes in behavioral reactions to events is critical to knowing when issues are resolved sufficiently to move on.

Case Example. One client was tormented by a voice that told him his dead son could not reach heaven without him. However, processing showed that this voice gave some link to his child that he would lose if the voice was to disappear. This connection needed to be fulfilled in other ways. While imagining his child in a safe place where he was looked after, the client noticed that he felt great relief of his anxieties for his child. As he came to trust that he could bring to mind images of his son having fun and being loved by his deceased grandmother, the voice began to be quiet. He used a soothing breathing and upright posture to ground himself into his compassionate image. For him, this image was an embodiment of his capacity to be a firm, loving parent. It became apparent that the voice was triggered by anxieties about his other children. The voice had the effect of making him overprotective toward them. His installation supported him to make wiser decisions about his children's care.

#### Conclusion

Therapies that harness the power of compassionate caregiving mentalities are now increasingly popular and evidence-based (Bateman & Fonagy, 2012; Germer, 2009; Gilbert, 2010; Lee, 2012; Siegel, 2010). Such therapies have principles which could be helpful in addressing complexity and attachment issues in EMDR. This article has been an initial attempt at scoping how EMDR could be adapted to incorporate a compassionate focus. EMDR could benefit from the additional resourcing that compassionate mind training allows because it keys people in to important neurobiological regulatory systems which emerge from our evolved attachment needs. The compassionate mind may prove useful in addressing blocks to processing and in finding interweaves by directly targeting barriers created by shame, criticism, and multiple ego states.

# REFERENCES

- Allen, J. G. (2013). Restoring mentalizing in attachment relationships: Treating trauma with plain old therapy. Arlington, VA: American Psychiatric Publishing.
- Bateman, A. W., & Fonagy, P. (2012). *The handbook of mentalizing in mental health practice*. Arlington, VA: American Psychiatric Association.
- Beaumont, E., Galpin, A., & Jenkins, P. (2012). Being kinder to myself: A prospective comparative study, exploring post-trauma therapy outcome measures, for two groups of clients, receiving either cognitive behaviour therapy or cognitive behaviour therapy and compassionate mind training. *Counselling Psychology Review*, 27(1), 31–43.
- Beaumont, E., & Martin, C. J. H. (2013). Using compassionate mind training as a resource in EMDR: A case study. *Journal of EMDR Practice and Research*, 7(4), 186–199.
- Belsky, J., & Pluess, M. (2009). Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin*, 135(6), 885–908.
- Bisson, J., & Andrew, M. (2007). Psychological treatment of post-traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews*, (3), CD003388.
- Blore, D. C., Holmshaw, E. M., Swift, A., Standart, S., & Fish, D. M. (2013). The development and uses of the "blind to therapist" EMDR protocol. *Journal of EMDR Practice and Research*, 7(2), 95–105.
- Bowlby, J. (1980). Attachment and loss: Loss, sadness and depression (Vol. 3). New York, NY: Basic Books.
- Cortina, M., & Liotti, G. (2010). Attachment is about safety and protection, intersubjectivity is about social understanding and sharing: The relationships between attachment and intersubjectivity. *Psychoanalytic Psychology*, *27*, 410–441.
- Cozolino, L. (2010). *The neuroscience of psychotherapy: Healing the social brain* (2nd ed.). New York, NY: Norton.
- Dalai Lama. (2005). *The power of compassion*. Uttar Pradesh, India: Harper Collins.
- Depue, R. A., & Morrone-Strupinsky, J. V. (2005). A neurobehavioral model of affiliative bonding: Implications for conceptualizing a human trait of affiliation. *Behavioral and Brain Sciences*, *28*(3), 313–349.
- Dworkin, M. (2005). *EMDR and the relational imperative: The therapeutic relationship in EMDR treatment.* New York, NY: Routledge.
- Dworkin, M., & Errebo, N. (2010). Rupture and repair in the EMDR client/clinician relationship: Now moments and moments of meeting. *Journal of EMDR Practice and Research*, 4(3), 113–123.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319–345.
- Fernyhough, C. (1996). The dialogic mind: A dialogic approach to the higher mental functions. *New Ideas in Psychology*, 14(1), 47–62.
- Fonagy, P. (1996). The significance of the development of metacognitive control over mental representations in parenting and infant development. *Journal of Clinical Psychoanalysis*, *5*, 67–86.

Fonagy, P., Gergely, G., & Jurist, E. L. (Eds.). (2003). Affect regulation, mentalization, and the development of the self. London, United Kingdom: Karnac Books.

Germer, C. K. (2009). The mindful path to self-compassion: Freeing yourself from destructive thoughts and emotions. New York, NY: Guilford Press.

Gilbert, P. (1989). *Human nature and suffering*. Hove, United Kingdom: Psychology Press.

Gilbert, P. (1998). What is shame? Some core issues and controversies. In P. Gilbert & B. Andrews, (Eds.), Shame: Interpersonal behaviour, psychopathology, and culture (pp. 3–38). New York, NY: Oxford University Press.

Gilbert, P. (2000). The relationship of shame, social anxiety and depression: The role of the evaluation of social rank. *Clinical Psychology and Psychotherapy*, *7*, 174–189.

Gilbert, P. (2007). Evolved minds and compassion in the therapeutic relationship. In P. Gilbert & R. Leahy (Eds.), *The therapeutic relationship in the cognitive behavioural psychotherapies*. London, United Kingdom: Routledge.

Gilbert, P. (2009). The compassionate mind: A new approach to life's challenges. Oakland, CA: New Harbinger Publications.

Gilbert, P. (2010). Compassion focused therapy: The CBT distinctive features series. London, United Kingdom: Routledge.

Gilbert, P. (2013). An evolutionary and compassion-focused approach to dissociation. In F. Kennedy, H. Kennerley, & D. Pearson (Eds.), Cognitive behavioural approaches to the understanding and treatment of dissociation. London, United Kingdom: Routledge.

Gilbert, P. (2014). The origins and nature of compassion focused therapy. *British Journal of Clinical Psychology*, 53, 6–41.

Gilbert, P., Birchwood, M., Gilbert, J., Trower, P., Hay, J., Murray, B., & Miles, J. N. V. (2001). An exploration of evolved mental mechanisms for dominant and subordinate behaviour in relation to auditory hallucinations in schizo-phrenia and critical thoughts in depression. Psychological Medicine, 31, 1117–1127.

Gilbert, P., & Choden. (2013). *Mindful compassion*. London, United Kingdom: Constable & Robinson.

Gilbert, P., & Irons, C. (2005). Focused therapies and compassionate mind training for shame and self-attacking.In P. Gilbert (Ed.), Compassion: Conceptualisations, research and use in psychotherapy (pp. 263–325). East Sussex, United Kingdom: Routledge.

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy*, 84(3), 239–255.

Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, 13(6), 353–379.

Goetz, J. L., Keltner, D., & Simon-Thomas, E. (2010). Compassion: An evolutionary analysis and empirical review. *Psychological Bulletin*, *136*(3), *351–374*.

Goss, K., & Allan, S. (2010). Compassion focused therapy for eating disorders. *International Journal of Cognitive Therapy*, 3(2), 141–158. Gumley, A., Braehler, C., & Macbeth, A. (2014). A metaanalysis and theoretical critique of oxytocin and psychosis: Prospects for attachment and compassion in promoting recovery. *British Journal of Clinical Psychology*, *53*(1), 42–61.

Harman, R., & Lee, D. (2010). The role of shame and selfcritical thinking in the development and maintenance of current threat in post-traumatic stress disorder. *Clinical Psychology & Psychotherapy*, 17(1), 13–24.

Herman, J. L. (1997). Trauma and recovery: The aftermath of violence—From domestic abuse to political terror. New York, NY: Basic Books.

Herman, J. L. (2011). Posttraumatic stress disorder as a shame disorder. In R. L. Dearing & J. P. Tangney (Eds.), *Shame in the therapy hour* (pp. 261–275). Washington, DC: American Psychological Association.

Irons, C., & Gilbert, P. (2005). Evolved mechanisms in adolescent anxiety and depression symptoms: The role of the attachment and social rank systems. *Journal of Adolescence*, 28(3), 325–341.

Lee, D. (2012). The compassionate mind approach to recovering from trauma. London, United Kingdom: Constable & Robinson.

Lee, D. A., Scragg, P., & Turner, S. W. (2001). The role of shame and guilt in traumatic events: A clinical model of shame-based and guilt-based PTSD. *British Journal of Medical Psychology*, 74, 451–466.

Liotti, G., & Gilbert, P. (2011). Mentalizing, motivation, and social mentalities: Theoretical considerations and implications for psychotherapy. *Psychology and Psychotherapy*, 84(1), 9–25.

Lucre, K. M., & Corten, N. (2012). An exploration of group compassion-focused therapy for personality disorder. *Psychology and Psychotherapy*, 86(4), 387–400. http:// dx.doi.org/ 10.1111/j.2044-8341.2012.02068

MacLean, P. D. (1990). The triune brain in evolution: Role in paleocerebral functions. New York, NY: Springer Publishing.

Matos, M., Pinto-Gouveia, J., & Gilbert, P. (2013). The effect of shame and shame memories on paranoid ideation and social anxiety. *Clinical Psychology & Psychotherapy*, 20(4), 334–349.

Maxfield, L., & Hyer, L. (2002). The relationship between efficacy and methodology in studies investigating EMDR treatment of PTSD. *Journal of Clinical Psychology*, *58*(1), 23–41.

Mayhew, S. L., & Gilbert, P. (2008). Compassionate mind training with people who hear malevolent voices: A case series report. *Clinical Psychology & Psychotherapy*, *15*(2), 113–138.

Meeks, T. W., & Jeste, D. V. (2009). Neurobiology of wisdom: A literature overview. *Archives of General Psychiatry*, 66(4), 355–365.

Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, *18*(3), 139–156.

Nathanson, D. L. (Ed.). (1987). *The many faces of shame*. New York, NY: Guilford Press.

- Neff, K. D. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, *2*(2), 85–101.
- Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and Identity*, *2*(3), 223–250.
- Ogden, P., Minton, K., & Pain, C. (2006). *Trauma and the body: A sensorimotor approach to psychotherapy*. New York, NY: Norton.
- Parnell, L. (2013). Attachment-focused EMDR: Healing relational trauma. New York, NY: Norton
- Schore, A. N. (2012). *The science of the art of psychotherapy*. New York, NY: Norton.
- Selcuk, E., Zayas, V., Änaydin, G., Hazan, C., & Kross, E. (2012). Mental representations of attachment figures facilitate recovery following upsetting autobiographical memory recall. *Journal of Personality and Social Psychology*, 48(3), 293–303.
- Shapiro, F. (2001). Eye movement desensitisation and reprocessing (EMDR): Basic principles, protocols, and procedures (2nd ed.). New York, NY: Guilford Press.
- Siegel, D. J. (1999). The developing mind: Toward a neurobiology of interpersonal experience. New York, NY: Guilford Press.
- Siegel, D. (2010). *Mindsight: The new science of personal transformation*. New York, NY: Bantam Books.
- Sorce, J. F., Emde, R. N., Campos, J. J., & Klinnert, M. D. (1985). Maternal emotional signaling: Its effect on the visual cliff behavior of 1-year-olds. *Developmental Psychol*ogy, 21(1), 195–200.
- Steel, C., Fowler, D., & Holmes, E. A. (2005). Traumarelated intrusions and psychosis: An information processing account. *Behavioural and Cognitive Psychotherapy*, 33(2), 139–152.
- Steele, K., van Der Hart, O., & Nijenhuis, E. R. (2005). Phase-oriented treatment of structural dissociation in

complex traumatization: Overcoming trauma-related phobias. *Journal of Trauma & Dissociation*, 6(3), 11–53.

- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, 15(1), 1–18.
- Tracy, J. L., Robins, R. W., & Tangney, J. P. (Eds.). (2007). *The self-conscious emotions: Theory and research*. New York, NY: Guilford Press.
- Wesselmann, D., Davidson, M., Armstrong, S., Schweitzer, C., Bruckner, D., & Potter, A. E. (2012). EMDR as a treatment for improving attachment status in adults and children. *Revue Européenne de Psychologie Appliquée/ European Review of Applied Psychology*, 62, 223–230.
- Whitehead, C. (2001). Social mirrors and shared experiential worlds. *Journal of Consciousness Studies*, 8(4), 3–36.
- Wilber, K. (1996). Up from Eden: A transpersonal view of human evolution. Wheaton, IL: Quest Books.
- Winnicott, D. W. (1953). Transitional objects and transitional phenomena—A study of the first not-me possession. *International Journal of Psycho-Analysis*, *34*, 89–97.
- Young, J., Zangwill, W., & Behary, W. (2002). Combining EMDR and schema-focused therapy: The whole may be greater than the sum of the parts. In F. Shapiro (Ed.), EMDR as an integrative psychotherapy approach (pp. 181– 209). New York, NY: Guilford.

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Correspondence regarding this article should be directed to Dr. Angela Kennedy, Tertiary Psychosis Service, Tees, Esk and Wear Valleys NHS Foundation Trust, Sniperley House, Lanchester Road Hospital, Durham, DH1 5RD, England. E-mail: Angela.kennedy6@nhs.net

# EMDR With Traumatized Refugees: From Experience-Based to Evidence-Based Practice

F. Jackie June ter Heide Trudy T. M. Mooren Arq Research Programme, Diemen, the Netherlands; Foundation Centrum '45, Oegstgeest/Diemen, the Netherlands

> Jeroen W. Knipscheer Rolf J. Kleber

Arq Research Programme, Diemen, the Netherlands; Department of Clinical & Health Psychology, Utrecht University, the Netherlands

Many refugees resettled in Western countries suffer from an accumulation of traumatic and current stressors that contribute to mental health problems and may complicate trauma-focused treatment. Consequently, the acceptability, safety, and efficacy of trauma-focused treatment with refugees have been a matter of clinical and scientific interest. In recent years, the evidence has accumulated for narrative exposure therapy and culturally adapted cognitive behavioral therapy. Although eye movement desensitization and reprocessing (EMDR) is practiced with resettled refugees, only five small studies of limited quality have been conducted on EMDR with this population. In the absence of strong evidence, therapists practising EMDR with refugees may be aided by transcultural psychiatric principles, especially matching of explanatory models. In addition, high-quality research is needed to reliably determine acceptability, safety, and efficacy of EMDR with traumatized refugees.

**Keywords:** eye movement desensitization and reprocessing (EMDR); refugees; systematic review; transcultural psychiatry

Reference of the set o

Excellence [NICE], 2005; Tol, Barbui, & Van Ommeren, 2013).

Following treatment guidelines, Western centers for refugee mental health are increasingly using EMDR with their refugee patients (e.g., Lab, Santos, & De Zulueta, 2008; Robertson, Blumberg, Gratton, Walsh, & Kayal, 2013; Sjölund, Kastrup, Montgomery, & Persson, 2009). EMDR may be a suitable approach for refugees because it does not include homework assignments, may minimalize language issues because speech is not always necessary, and has been found efficacious with patients from non-Western cultural backgrounds (Jaberghaderi, Greenwald, Rubin, Zand, & Dolatabadi, 2004). However, conclusions drawn on the basis of research with general populations, even when cross-cultural, may not necessarily generalize to refugees. Refugees suffering from chronic PTSD are generally considered complex populations with whom the efficacy of psychotherapy should be separately studied. Unfortunately, so far evidence on EMDR with refugees has been scarce. The aim of this article is to increase awareness of possible challenges involved in EMDR treatment with refugees and stimulate outcome research of EMDR with this population. To that end, this article outlines the psychosocial and transcultural complexities of treating traumatized refugees with EMDR, evaluates the research to date, and proposes a research agenda.

## **Refugee Trauma and Treatment**

#### Who Is a Refugee?

Who is defined as refugee is primarily a legal matter. Refugees are those who, because of well-founded fears of persecution for reasons of race, religion, nationality, membership of a particular social group, or political opinion, are outside their countries of nationality and are unable or unwilling to avail themselves of the protection of those countries. Those who are legally acknowledged to meet this definition are granted the right not to be sent back to their countries of origin. Asylum seekers are those whose claim to that right is still under examination. In 2013, 11.1 million refugees and 987,000 asylum seekers were of concern to the United Nations High Commissioner for Refugees (UNHCR) worldwide (see www.unhcr.org). Most refugees are originally from Asia and Africa and find shelter in their regions of origin, but a fifth of refugees resettle in the West (Europe, North America, and Australia). This article is concerned with the subgroup of resettled refugees who seek treatment in Western mental health settings for trauma-related disorders.

#### Refugee Stressors and Mental Health

Mental health of refugees is generally acknowledged to be influenced both by traumatic and current stressors (e.g., Miller & Rasmussen, 2010). Refugees are at high risk of experiencing traumatic events before, during, and after their flight (Silove, Tarn, Bowles, & Reid, 1991). Before fleeing, traumatic events may vary from imprisonment and torture in political refugees, forced witnessing and committing of atrocities in former child soldiers, and bombings and rape in civilian war survivors, to injury and witnessing the death of others in refugee military veterans. The flight itself may be traumatizing because refugees often employ the use of smugglers to cross international borders and in the process may face serious threats including injury or death or human trafficking (e.g., Arbel & Brenner, 2013). After the flight, refugees are at risk of being imprisoned or deported (e.g., Robjant, Hassan, & Katona, 2009), whereas women and children are at special risk of sexual abuse or exploitation (see www.unhcr.org). Meta-analytically, torture and a cumulative number of traumatic experiences form risk factors for development of PTSD and depression in adult refugees, with torture explaining almost a quarter of the variance in PTSD (Steel et al., 2009). In refugee children also, the key risk factor for PTSD is exposure to violence (Fazel, Reed, Panter-Brick, & Stein, 2011).

In addition to traumatic stressors, current stressors both in the country of refuge and the country of origin impact the mental health of both adults and children (Fazel et al., 2011; Steel et al., 2009). Obtaining the legal label of refugee in a Western country often requires a lengthy asylum process which carries a tremendous amount of stress (e.g., Laban, Gernaat, Komproe, Schreuders, & De Jong, 2004; Robjant et al., 2009). Also after obtaining a residency status, refugees have to cope with stressors such as loss of country, cultural resources, family, friends, and social status (e.g., Summerfield, 2001). At the same time, family and friends in the country of origin may continue to suffer from ongoing conflict, causing great anxiety to those living in relative safety.

Consequently, for adult refugees resettled in Western countries, prevalence of PTSD is around 9% and prevalence of depression around 5% (Fazel, Wheeler, & Danesh, 2005). Upon inclusion of those who have fled to another region in their own countries (internally displaced persons) and of refugees and asylum seekers in developing countries, prevalence rates rise to 31% for both PTSD and depression (Steel et al., 2009). For refugee children and adolescents living in Western countries, PTSD prevalence ranges from 7% to 17% (Fazel et al., 2005), depression from 3% to 30% (Bronstein & Montgomery, 2011). The accumulation of stressors not only leaves refugees at higher risk of developing mental health problems than general populations (Bronstein & Montgomery, 2011; Fazel et al., 2005), economic migrants (Lindert, Von Ehrenstein,

Priebe, Mielck, & Brähler, 2009), and compatriots who have stayed in their countries of origin (Porter & Haslam, 2001), but may also complicate their psychosocial recovery.

#### Trauma-Focused Therapy With Refugees: Clinical Challenges

Because of the accumulation of traumatic and current stress faced by refugees, treatment for traumatized refugees has long consisted of supportive, unstructured, multimodal interventions, with no central focus on processing of traumatic memories and with limited effectiveness (e.g., Boehnlein et al., 2004; Carlsson, Mortensen, & Kastrup, 2005). However, in response to the evidence base for traumafocused cognitive behavioral therapy and EMDR (e.g., Bisson et al., 2007), trauma-focused treatment has increasingly been incorporated in care as usual with refugees. To fine-tune care provision, several authors have drawn attention to the clinical challenges faced when providing trauma-focused treatment to refugees.

Acceptability. Authors such as Summerfield (1999) and Miller, Kulkarni, and Kushner (2006) have addressed the issue of acceptability of individual trauma-focused treatments to refugees. They argue that a predominant treatment focus on trauma and PTSD may not fully meet refugees' needs for various reasons. First, contrary to single traumatic experiences such as traffic accidents, war and persecution primarily cause destruction at a societal rather than an individual level. Interventions should therefore primarily be aimed at collectives rather than individuals. Second, although traumafocused treatments have been designed to alleviate PTSD, the PTSD construct may not appropriately reflect refugees' responses to experiences of war or persecution. These may consist of different symptom constellations for which tailored interventions may need to be designed. Third, the notion of "working through" of traumatic experiences is of Western origin and may not be applicable transculturally (see also Kleber, Figley, & Gersons, 1995), with some refugees preferring present-centered interventions over trauma-focused interventions (e.g., Morris et al., 1993). Fourth, survivors of war and persecution tend to prioritize practical concerns such as obtainment of work, education, and housing over mental health concerns, and traumafocused therapy may therefore not appeal to them. Although these arguments have served to raise awareness of the need for holistic and tailored approaches, objections have also been made. Hinton and Lewis-Fernández (2011) have shown that although transcultural variation may exist in the prevalence of avoidance and somatic symptoms and in the interpretation of traumatic events and traumarelated symptoms, PTSD is found across cultures in response to traumatic events. Other authors (e.g., Hodes & Goldberg, 2002) argue that traumafocused therapy may be imperative for a subgroup of refugees who do not recover from PTSD after having their practical needs met.

Safety. There is a longstanding assumption within refugee care that exposure to traumatic memories may lead to unmanageable distress or adverse effects (e.g., Nickerson, Bryant, Silove, & Steel, 2011). This assumption is rooted within the conceptualization of refugees as suffering from complex PTSD (e.g., Palic & Elklit, 2011). Complex PTSD includes the core symptoms of PTSD in conjunction with emotion regulation difficulties, disturbances in relational capacities, alterations in attention and consciousness, adversely affected belief systems, and somatic distress or disorganization (Cloitre et al., 2012). The few studies that have been conducted on complex PTSD in refugees have shown that the majority of traumatized refugees do not suffer from complex PTSD (De Jong, Komproe, Spinazzola, Van der Kolk, & Van Ommeren, 2005; Palic & Elklit, 2014; Teodorescu, Heir, Hauff, Wentzel-Larsen, & Lien, 2012; Weine et al., 1998). Nevertheless, a phased treatment approach, fitting with the complex PTSD diagnosis, is often advised for traumatized refugees (e.g., NICE, 2005). According to this approach, to avoid symptom increase, trauma-focused work should not be undertaken until a secure treatment alliance has been formed and the patient is physically safe and emotionally and behaviorally stable. As many refugees are living in unsafe or unstable conditions, especially during the asylum process, their ability to undergo trauma-focused therapy is often clinically questioned. In recent years, the experience-based emphasis on physical safety has been challenged by research indicating that asylum seekers may benefit from unphased trauma-focused therapy even in the absence of a residency status (e.g., Neuner et al., 2010; Stenmark, Catani, Neuner, Elbert, & Holen, 2013). Although the evidence is still limited, these findings may result in a shortening of the stabilization phase and offering trauma-focused treatment to a broader range of refugees.

Efficacy. The efficacy of offering Western traumafocused treatments to non-Western clients has been a matter of transcultural interest (Wilson & Drožđek, 2007). It has been argued that all clients suffering from PTSD, regardless of cultural background, should be offered trauma-focused treatment but that cultural adaptations to trauma-focused treatments may need to be made to increase efficacy (Zayfert, 2008). Metaanalytically, the main reason why culturally adapted psychotherapy is significantly more effective than nonadapted psychotherapy is because it offers a better match between therapy and client in explanatory models of mental illness and psychological distress (Benish, Quintana, & Wampold, 2011). Ethnic matching between client and therapist, although often preferred by clients, has not been shown to increase efficacy (Cabral & Smith, 2011). However, language matching (conducting psychotherapy in the client's mother tongue) has (Griner & Smith, 2006). As refugee populations are usually culturally diverse, language matching may not always be possible. Consequently, interpreters may need to be used, which alters therapeutic alliance and process (e.g., Miller, Martell, Pazdirek, Caruth, & Lopez, 2005). Although in some clinical trials of trauma-focused therapy interpreters have been used (e.g., Neuner et al., 2010; Stenmark et al., 2013; Ter Heide, Mooren, Kleijn, De Jongh, & Kleber, 2011), it is too early to draw definite conclusions on the influence of interpreters on treatment effectiveness.

Although literature on the issues of acceptability, safety, and efficacy of trauma-focused treatment with refugees has served to alert clinicians to potential clinical challenges, transcultural data are providing increasing clarity on which arguments hold under scientific scrutiny. In recent years, the evidence has accumulated for two forms of trauma-focused therapy, which we will discuss in the following paragraph.

Psychological Treatment of Refugees: Current Evidence

As noted, treatment for refugees has long consisted of multimodal, supportive interventions, and sometimes care was taken "not to remind survivors of their past traumatic experiences" (McIvor & Turner, 1995, p. 707). Since the publication of the first trauma-focused trial comparing CBT and exposure therapy in refugees, which resulted in large effect sizes for both conditions (Paunovic & Öst, 2001), this stance has become increasingly untenable. Two

forms of trauma-focused treatment that have since gathered most evidence also take a cognitive behavioral approach. In narrative exposure therapy (NET), refugees are exposed to traumatic memories and associated emotions by narrating their life story, of which a written report is made (Schauer, Neuner, & Elbert, 2005). In NET, transcultural acceptability has been taken into account by employing the crosscultural form of narrative, whereas the provision of a written report that may be presented as statement in a legal or human rights context may also increase acceptability to refugees. NET has been shown to have high safety as well as result in very large effect sizes with refugees in stable and less stable settings (Nickerson et al., 2011; Palic & Elklit, 2011; Robjant & Fazel, 2010; Stenmark et al., 2013). A second treatment resulting in large effect sizes is a form of culturally adapted CBT (CACBT) developed by Hinton and colleagues (2004, 2005). CACBT pays special attention to treatment acceptability by focusing interventions on culture-specific symptoms and using interventions that may have culture-specific appeal. Treatment protocol consists of various interventions, including relaxation, mindfulness, visualizations, and exposure to culture-specific somatic sensations and traumatic memories. NET and CACBT are similar in that they are both highly structured treatments that are limited in length, but they differ greatly in how much time is spent on processing of traumatic memories: Although trauma processing is the main intervention in NET, it is only minimal in CACBT.

In conclusion, current evidence points to the safety and efficacy of trauma-focused treatment with resettled refugees when providing a culture-sensitive rationale and intervention. We now turn to the practice and research of EMDR with traumatized refugees.

# **EMDR** with Traumatized Refugees: Practice and Research

#### EMDR in Western Mental Health Settings

The individual EMDR protocol for PTSD consists of the following steps: (a) taking of patient history and treatment planning; (b) preparation through psychoeducation and stabilizing interventions; (c) assessment of the target memory and its corresponding negative and positive cognitions, emotion, and level, and location of distress; (d) desensitization and reprocessing of traumatic material using an attention-demanding task such as tracking the therapist's fingers with the eyes; (e) installation of positive cognition; (f) scanning of the body for remaining distress; (g) session closure; and (h) reevaluation (Shapiro, 2001). The children's protocol has some age-appropriate adaptations (Rodenburg et al., 2009). With traumatized refugees, the EMDR protocol can be applied as the sole therapeutic intervention or as part of a phased or multimodal approach.

Several case reports have appeared describing the successful use of EMDR with refugees from diverse cultural backgrounds. Ross and Gonsalves (1993) present an early case of a Guatemalan refugee who was repeatedly imprisoned and tortured for political activities. The patient presented with a range of symptoms diagnosable as complex PTSD, which were treated with eclectic short-term psychotherapy. Two sessions of EMDR in the middle of treatment resulted in improved sleep and cessation of nightmares. Bower, Pahl, and Bernstein (2004) describe the multimodal treatment of a Bosnian female refugee who suffered from PTSD and depression following detainment and repeated rape in a concentration camp, during which the names of her abusers were tattooed on her body. Psychotropic medication and removal of tattoos led to great decrease of depressive symptoms. Subsequently, five EMDR sessions resulted in diminished nightmares, distressing memories, and anxiety. Therapy continued with counseling focused on psychosocial issues. Ilic (2004) illustrates his description of EMDR with former prisoners of war with a case report of a Croatian refugee military veteran who was tortured in a prisoner of war camp. The patient presented with chronic PTSD including nightmares and rumination. After a preparatory phase, three sessions of EMDR resulted in significant reduction of PTSD symptoms, and treatment was continued with psychosocial rehabilitation. Stöfsel (2005) describes a case series of EMDR within a phased approach. With six patients, EMDR was successful (meaning that all relevant traumatic memories had been processed and SUD had gone down from 8-10 to 0); however, two hospitalized patients were unable to manage emotions raised by EMDR and EMDR was terminated. No further details are provided in this case series. Regel and Berliner (2007) describe the case of a Kurdish Iraqi torture survivor who suffered from a multitude of symptoms including PTSD, depression, and social phobia. After stabilization and graded exposure in vivo, EMDR was implemented to process traumatic memories. After a total of 12 sessions, the patient was acceptant of occasional troubling

memories, had a stable mood and sleeping pattern, was regularly employed, and was active in helping other refugees.

#### Systematic Review: Method

Although EMDR is being used in clinical practice with refugees, no systematic review yet exists informing therapists and researchers on the state of the evidence for EMDR with refugee populations. We conducted a systematic search for outcome studies of EMDR with asylum seekers and refugees of all ages treated in Western settings. Our aim was to answer the following questions: Which treatment outcome studies on EMDR with refugees in Western settings have been conducted? What are the main findings in terms of dropout and outcome measures? To what extent do those studies meet the gold standards for PTSD treatment outcome studies (i.e., clearly defined target symptoms; reliable and valid measures; use of blind evaluators; assessor training; manualized, replicable, specific treatment programs; unbiased assignment to treatment; and treatment adherence; Foa & Meadows, 1997)? Finally, which conclusions can be drawn on treatment outcome of EMDR with refugees?

In October 2013, we searched PsycINFO, PubMed, PILOTS, the Francine Shapiro Library, and the Journal of EMDR Practice and Research using the search strategy (EMDR OR "eye movement desensitis/zation") AND (refugee\* OR asylum OR displaced OR torture OR persecution). In addition, we sent e-mails to all national EMDR organizations and to authors of presentation abstracts retrieved in the searches, asking if they knew of or had conducted any studies on EMDR with refugees. This search yielded 110 records. Most records presented clinical reports, recommendations, or reflections rather than research. Five studies were found that described study design and method as well as presented statistical data on treatment outcome.

#### Systematic Review: Results

Groenenberg and Van Waning (2002) conducted a pilot study of EMDR with eight asylum seekers and refugees. As part of regular phased treatment, one to six sessions of EMDR were conducted. One patient dropped out after the second session because of increasing distress. The remaining seven patients showed some decrease in anxiety and depression. As far as the gold standards are concerned, only replicable treatment and reliable, valid outcome measures were used; target symptoms, although clearly defined, did not include PTSD.

Oras, Cancela de Ezpeleta, and Ahmad (2004) studied the effectiveness of EMDR in a psychodynamic context with 13 refugee children (aged 8–16 years) suffering from PTSD. EMDR sessions ranged from one to six. No participants ended treatment prematurely. Treatment resulted in significant improvement in PTSD and Global Assessment of Functioning (GAF) scores. This study adhered only to clear definition of target symptoms; replicable treatment; and reliable, valid outcome measures.

Elofsson, Von Schèele, Theorell, and Söndergaard (2008) conducted a study of the physiological correlates of EMDR with 13 male resettled refugees. Only changes in *subjective units of distress* (SUD) per session were included as indication of clinical improvement. No dropouts are reported. SUD scores decreased significantly during the 17 sessions. Treatment was replicable and the physiological outcome measures were clear, reliable, and valid. No other gold standards were reported to have been met in this study.

In a pilot study by Renner, Bänninger-Huber, and Peltzer (2011), 94 Chechen asylum seekers and refugees were randomly assigned to either 15 sessions of a Culture-Sensitive and Resource Oriented Peer group, 15 CBT group sessions, 3 sessions of EMDR, or waitlist. Of the 17 participants assigned to EMDR, 3 dropped out because of inability to visualize a specific traumatic event. EMDR participants did not improve in PTSD, anxiety, or depression. Most gold standards were met, but no clinician-rated assessment requiring blindness and training of evaluators took place and treatment adherence was not measured. In addition, this study suffered from limitations in design (PTSD symptomatology was not an inclusion criterion, treatment dose was not equal for all conditions, and the dose of EMDR that was actually administered was unclear).

Finally, in another randomized pilot study (Ter Heide et al., 2011) 11 sessions of EMDR were compared with 11 sessions of stabilization in 20 asylum seekers and refugees with chronic PTSD. Dropout was equal in both conditions, with five participants prematurely ending EMDR because of satisfaction with symptom reduction, not wanting to speak about the past, and withdrawal by their study therapist because of current stress and cultural factors. EMDR participants showed some improvement in PTSD, anxiety, and depression. This study met all gold standards of PTSD treatment outcome studies.

# **EMDR With Refugees: A Research Agenda**

Although EMDR is recommended and offered in clinical practice with refugees, research evaluating its acceptability, safety, and efficacy has lagged behind. Our systematic review of studies on EMDR with refugees in Western settings yielded only five studies: two naturalistic designs of EMDR with adults and children within a phased format, one physiological study into the effectiveness of eye movements, and two pilot randomized trials of unphased EMDR. Full randomized studies providing the highest level of evidence were lacking. None but one of the studies met all gold standards of PTSD outcome research. Consequently, no conclusions on acceptability, safety, and efficacy of EMDR with refugees can currently be drawn. If EMDR with refugees is to become evidence-based, research needs to be conducted in all three domains.

Acceptability. It is recommended to study acceptability when examining a new treatment or an existing treatment with a new population (e.g., Lancaster, Dodd, & Williamson, 2004). Acceptability may be defined as refusing treatment or dropping out of treatment because of an insufficient match in treatment rationale between patient and treatment. Three studies (Groenenberg & Van Waning, 2002; Renner et al., 2011; Ter Heide et al., 2011) reported occasional refusals or dropout of EMDR because patients did not want to speak about the past. Although this may be related to treatment quality (such as providing insufficient information about treatment rationale) or study design (directly starting with EMDR without a prior stabilization phase), findings may also be in line with the argument that processing of traumatic memories may not appeal to some refugees. Questions on the ratio of acceptability versus nonacceptability may be answered by studies using unbiased assignment which keep track of refusals and dropout. Should EMDR have low acceptability to a subgroup of refugee patients, reasons for refusal may be explored as well as ways to increase acceptability, for example by using culturally specific metaphors to explain the mechanism of EMDR (e.g., Silver & Rogers, 2002).

*Safety.* Reporting of safety (also called "harm") of treatments has been encouraged to increase quality of clinical trial reports (Ioannidis et al., 2004). Safety

may be specified as an extent of symptom increase or the occurrence of specific adverse effects, such as suicide attempts. Although none of the five studies that came up in our review pointed to unsafety of EMDR, sample sizes were small and full randomized trials are needed to examine if EMDR may lead to adverse effects in a subgroup of patients. Subsequently, treatment predictors may be explored. Are refugees who experience high current stress, such as asylum seekers or illegals, more likely to experience adverse effects than those with relatively low current stress? Is severity of depression or psychotic symptoms a risk factor for adverse effects? Are adverse effects more likely to occur in refugee patients who immediately start with EMDR than in those who receive prior skills training? Data on these issues may aid practitioners in fine-tuning the timing of EMDR.

Efficacy. When studying the efficacy of an intervention, two questions are of interest: Is the intervention efficacious, and is it more efficacious than existing treatments. Although all but one study reported EMDR to have some degree of effectiveness or efficacy, high-quality randomized trials are needed to reliably determine the efficacy of EMDR with refugees. Because efficacy depends greatly on treatment design, different designs may be used. To determine optimal efficacy of EMDR, EMDR may be studied as sole therapeutic intervention compared to waitlist, within a phased format compared to direct EMDR or within a multimodal format compared to only EMDR. Number of treatment sessions may be standardized or may be made dependent on treatment efficacy. To determine the size of differences in efficacy between treatments, EMDR may be compared to care as usual or to evidence-based treatments such as NET. The efficacy of EMDR with interpreters also deserves specific attention. Information on efficacy of EMDR in different study designs is essential in helping practitioners choose the intervention as well as outline an order or combination of interventions.

#### Conclusion

Asylum seekers and refugees form diverse and complex populations, coming from multiple cultural backgrounds, having survived a diversity of life-threatening experiences, and living in more or less safe and stable environments. Although EMDR has been found efficacious in adults suffering from PTSD, research findings may not automatically generalize to traumatized refugees. In fine-tuning EMDR to resettled refugees, clinicians may be aided by principles derived from transcultural psychiatry, such as mapping multiple stressors, reaching agreement on treatment focus and rationale, and developing cultural adaptations to the EMDR treatment protocol. In addition, high-quality studies yielding reliable data on the acceptability, safety, and efficacy of EMDR with refugees are needed to move EMDR from experience-based practice to evidence-based practice with this population.

#### References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Arbel, E., & Brenner, A. (2013). Bordering on failure: Canada-U.S. border policy and the politics of refugee exclusion. Boston, MA: Harvard Immigration and Refugee Law Clinical Program.
- Benish, S. G., Quintana, S., & Wampold, B. E. (2011). Culturally adapted psychotherapy and the legitimacy of myth: A direct-comparison meta-analysis. *Journal of Counseling Psychology*, 58, 279–289.
- Bisson, J. I., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder: Systematic review and meta-analysis. *British Journal of Psychiatry*, 2, 97–104.
- Boehnlein, J. K., Kinzie, D. J., Sekiya, U., Riley, C., Pou, K., & Rosborough, B. (2004). A ten-year treatment outcome study of traumatized Cambodian refugees. *Journal* of Nervous and Mental Disease, 192, 658–663.
- Bower, R. D., Pahl, L., & Bernstein, M. A. (2004). Case presentation of a tattoo-mutilated, Bosnian torture survivor. *Torture*, 14(1), 16–24.
- Bronstein, I., & Montgomery, P. (2011). Psychological distress in refugee children: A systematic review. *Clinical Child and Family Psychology Review*, 14, 44–56.
- Cabral, R. R., & Smith, T. B. (2011). Racial/ethnic matching of clients and therapists in mental health services: A meta-analytic review of preferences, perceptions, and outcomes. *Journal of Counseling Psychology*, 58(4), 537–554.
- Carlsson, J. M., Mortensen, E. L., & Kastrup, M. (2005). A follow-up study of mental health and health-related quality of life in tortured refugees in multidisciplinary treatment. *Journal of Nervous and Mental Disease*, 193, 651–657.
- Cloitre, M., Courtois, C. A., Ford, J. D., Green, B. L., Alexander, P., Briere, J., ... van der Hart, O. (2012). The ISTSS expert consensus treatment guidelines for complex

*PTSD in adults*. Retrieved from http://www.istss.org/ ISTSS\_Complex\_PTSD\_Treatment\_Guidelines/5205 .htm

- De Jong, J. T. V. M., Komproe, I. H., Spinazzola, J., Van der Kolk, B. A., & Van Ommeren, M. H. (2005). DESNOS in three postconflict settings: Assessing cross-cultural construct equivalence. *Journal of Traumatic Stress, 18*(1), 13–21.
- Elofsson, U. O., Von Schèele, B., Theorell, T., & Söndergaard, H. P. (2008). Physiological correlates of eye movement desensitization and reprocessing. *Journal of Anxiety Disorders*, *22*, 622–634.
- Fazel, M., Reed, R. V., Panter-Brick, C., & Stein, A. (2011). Mental health of displaced and refugee children resettled in high-income countries: Risk and protective factors. *Lancet*, 379, 250–265.
- Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7000 refugees resettled in western countries: A systematic review. *Lancet*, 365, 1309–1314.
- Foa, E. B., & Meadows, E. A. (1997). Psychosocial treatments for posttraumatic stress disorder: A critical review. *Annual Review of Psychology*, 48, 449–480.
- Griner, D., & Smith, T. B. (2006). Culturally adapted mental health intervention: A meta-analytic review. *Psychotherapy: Theory, Research, Practice, Training, 43*, 531–548.
- Groenenberg, M., & Van Waning, A. (2002). Brug tussen negatieve en positieve beleving: EMDR als therapie na oorlogsgeweld [Bridge between negative and positive affect: EMDR as therapeutic intervention after war violence]. *Phaxx*, 6, 6–9.
- Hinton, D. E., Chhean, D., Pich, V., Safren, S. A., Hofmann, S. G., & Pollack, M. H. (2005). A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: A cross-over design. *Journal of Traumatic Stress*, 18(6), 617–629.
- Hinton, D. E., & Lewis-Fernández, R. (2011). The crosscultural validity of posttraumatic stress disorder: Implications for DSM-5. *Depression and Anxiety*, 28, 783–801.
- Hinton, D. E., Pham, T., Tran, M., Safren, S. A., Otto, M. W., & Pollack, M. H. (2004). CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: A pilot study. *Journal of Traumatic Stress*, 17(5), 429–433.
- Hodes, M., & Goldberg, D. (2002). The treatment of refugees: Service provision reflects Britain's ambivalence. *Psychiatric Bulletin*, *26*, 1–2.
- Ilic, Z. (2004). EMDR u lečenju posttraumatskog stresnog poremećaja kod ratnih zarobljenika [EMDR in the treatment of posttraumatic stress disorder with prisoners of war]. In Ž. Špiric, G. Kneževic, V. Jovic, & G. Opacic (Eds.), Tortura u ratu, posledice I rehabiliatcija: Jugoslovensko iskustvo [Torture in war, consequences and rehabilitation of victims: Yugoslav experience] (pp. 267–

276). Belgrade, Serbia: Centar za rehabilitaciju žrtava torture [International Aid Network].

- Ioannidis, J. P. A., Evans, S. J. W., Gøtzsche, P. C., O'Neill, R. T., Altman, D. G., Schulz, K., & Moher, D.; CON-SORT Group. (2004). Better reporting of harms in randomized trials: An extension of the CONSORT statement. *Annals of Internal Medicine*, 141, 781–788.
- Jaberghaderi, N., Greenwald, R., Rubin, A., Zand, S. O., & Dolatabadi, S. (2004). A comparison of CBT and EMDR for sexually-abused Iranian girls. *Clinical Psychology and Psychotherapy*, 11(5), 358–368.
- Kleber, R. J., Figley, C. R., & Gersons, B. P. R. (Eds.). (1995). *Beyond trauma: Cultural and societal dimensions*. New York, NY: Plenum Press.
- Lab, D., Santos, I., & De Zulueta, F. (2008). Treating posttraumatic stress disorder in the 'real world': Evaluation of a specialist trauma service and adaptations to standard treatment approaches. *Psychiatric Bulletin, 32*, 8–12.
- Laban, C. J., Gernaat, H. B., Komproe, I. H., Schreuders, B. A., & De Jong, J. T. (2004). Impact of a long asylum procedure on the prevalence of psychiatric disorders in Iraqi asylum seekers in the Netherlands. *Journal of Nervous and Mental Disease*, 192, 843–851.
- Lancaster, G. A., Dodd, S., & Williamson, P. R. (2004). Design and analysis of pilot studies: Recommendations for good practice. *Journal of Evaluation in Clinical Practice*, 10(2), 307–312.
- Lindert, J., Ehrenstein, O. S., Priebe, S., Mielck, A., & Brähler, E. (2009). Depression and anxiety in labor migrants and refugees: A systematic review and metaanalysis. *Social Science & Medicine*, 69, 246–257.
- McIvor, R. J., & Turner, S. W. (1995). Assessment and treatment approaches for survivors of torture. *British Journal of Psychiatry*, 166(6), 705–711.
- Miller, K. E., Kulkarni, M., & Kushner, H. (2006). Beyond trauma-focused psychiatric epidemiology: Bridging research and practice with war-affected populations. *American Journal of Orthopsychiatry*, 76(4), 409–422.
- Miller, K. E., Martell, Z. L., Pazdirek, L., Caruth, M., & Lopez, D. (2005). The role of interpreters in psychotherapy with refugees: An exploratory study. *American Journal of Orthopsychiatry*, 75(1), 27–39.
- Miller, K. E., & Rasmussen, A. (2010). War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. *Social Science & Medicine*, 70, 7–16.
- Morris, P., Silove, D., Manicavasagar, V., Bowles, R., Cunningham, M., & Tarn, R. (1993). Variations in therapeutic interventions for Cambodian and Chilean refugee survivors of torture and trauma: A pilot study. *Australian and New Zealand Journal of Psychiatry*, *27*, 429–435.
- National Institute for Clinical Excellence. (2005). Posttraumatic stress disorder: The management of PTSD in adults and children in primary and secondary care. London, UK: Gaskell.

- Neuner, F., Kurreck, S., Ruf, M., Odenwald, M., Elbert, T., & Schauer, M. (2010). Can asylum-seekers with posttraumatic stress disorder be successfully treated? A randomized controlled pilot study. *Cognitive Behaviour Therapy*, *39*, 81–91.
- Nickerson, A., Bryant, R. A., Silove, D., & Steel, Z. (2011). A critical review of psychological treatments of posttraumatic stress disorder in refugees. *Clinical Psychology Review*, 31, 399–417.
- Oras, R., Cancela de Ezpeleta, S., & Ahmad, A. (2004). Treatment of traumatized refugee children with Eye Movement Desensitization and Reprocessing in a psychodynamic context. *Nordic Journal of Psychiatry*, *58*(3), 199–203.
- Palic, S., & Elklit, A. (2011). Psychosocial treatment of posttraumatic stress disorder in adult refugees: A systematic review of prospective treatment outcome studies and a critique. *Journal of Affective Disorders*, 131, 8–23.
- Palic, S., & Elklit, A. (2014). Personality dysfunction and complex posttraumatic stress disorder among chronically traumatized Bosnian refugees. *Journal of Nervous* and Mental Disease, 202(2), 111–118.
- Paunovic, N., & Öst, L. G. (2001). Cognitive-behavior therapy vs exposure therapy in the treatment of PTSD in refugees. *Behaviour Research and Therapy*, *39*, 1183–1197.
- Porter, M., & Haslam, N. (2001). Forced displacement in Yugoslavia: A meta-analysis of psychological consequences and their moderators. *Journal of Traumatic Stress*, 14(4), 817–834.
- Regel, S., & Berliner, P. (2007). Current perspectives on assessment and therapy with survivors of torture: The use of a cognitive behavioural approach. *European Journal of Psychotherapy & Counselling*, 9(3), 289–299.
- Renner, W., Bänninger-Huber, E., & Peltzer, K. (2011). Culture-Sensitive and Resource Oriented Peer (CROP)-Groups as a community based intervention for trauma survivors: A randomized controlled pilot study with refugees and asylum seekers from Chechnya. *Australasian Journal of Disaster and Trauma Studies*, 1, 1–13.
- Robertson, M. E., Blumberg, J. M., Gratton, J. L., Walsh, E. G., & Kayal, H. (2013). A group-based approach to stabilisation and symptom management in a phased treatment model for refugees and asylum seekers. *European Journal of Psychotraumatology*, 4, 21407. http://dx.doi .org/10.3402/ejpt.v4i0.21407
- Robjant, K., & Fazel, M. (2010). The emerging evidence for Narrative Exposure Therapy: A review. *Clinical Psychol*ogy *Review*, 30, 1030–1039.
- Robjant, K., Hassan, R., & Katona, C. (2009). Mental health implications of detaining asylum seekers: Systematic review. *British Journal of Psychiatry*, 194, 306–312.
- Rodenburg, R., Benjamin, A., De Roos, C., Meijer, A. M., & Stams, G. J. (2009). Efficacy of EMDR in children: A meta-analysis. *Clinical Psychology Review*, 29, 599–606.
- Ross, J., & Gonsalves, C. J. (1993). Brief treatment of a torture survivor. In R. A. Wells & V. J. Giannetti (Eds.),

*Case book of the brief psychotherapies* (pp. 27–51). New York, NY: Plenum Press.

- Schauer, M., Neuner, F., & Elbert, T. (2005). Narrative Exposure Therapy (NET): A short-term intervention for traumatic stress disorders. Göttingen, Germany: Hogrefe & Huber.
- Shapiro, F. (2001). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures. New York, NY: Guilford Press.
- Silove, D., Tarn, R., Bowles, R., & Reid, J. (1991). Psychosocial needs of torture survivors. *Australian and New Zealand Journal of Psychiatry*, 25, 481–490.
- Silver, S. M., & Rogers, S. (2002). Light in the heart of darkness: EMDR and the treatment of war and terrorism survivors. New York, NY: Norton.
- Sjölund, B., Kastrup, M., Montgomery, E., & Persson, A. L. (2009). Rehabilitating torture survivors. *Journal of Rehabilitation Medicine*, 41, 689–696.
- Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R. A., & Van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: A systematic review and meta-analysis. *Journal of the American Medical Association*, 302(5), 537–549.
- Stenmark, H., Catani, C., Neuner, F., Elbert, T., & Holen, A. (2013). Treating PTSD in refugees and asylum seekers within the general health care system: A randomized controlled multicentre study. *Behaviour Research and Therapy*, *51*, 641–647.
- Stöfsel, M. (2005). EMDR-behandeling in het Sinai Centrum: Drie jaar ervaring [EMDR treatment at the Sinai Centre: Three years of experience]. *Cogiscope*, 1, 2–9.
- Summerfield, D. (1999). A critique of seven assumptions behind psychological trauma programmes in waraffected areas. *Social Science & Medicine*, 48, 1449–1462.
- Summerfield, D. (2001). Asylum-seekers, refugees and mental health services in the UK. *Psychiatric Bulletin*, *25*, 161–163.
- Teodorescu, D. S., Heir, T., Hauff, E., Wentzel-Larsen, T., & Lien, L. (2012). Mental health problems and postmigration stress among multi-traumatized refugees attending outpatient clinics upon resettlement in Norway. *Scandinavian Journal of Psychology*, *53*, 316–332.
- Ter Heide, F. J., Mooren, T. M., Kleijn, W., De Jongh, A., & Kleber, R. J. (2011). EMDR versus stabilisation in traumatised asylum seekers and refugees: Results of a pilot study. *European Journal of Psychotraumatology*, 2, 5881. http://dx.doi.org/10.3402/ejpt.v2i0.5881
- Tol, W. A., Barbui, C., & Van Ommeren, M. (2013). Management of acute stress, PTSD, and bereavement: WHO recommendations. *Journal of the American Medical Association, 310, 477–478.*
- Weine, S. M., Becker, D. F., Vojvoda, D., Hodzic, E., Sawyer, M., Hyman, L., Laub, D., & McGlashan, T. H. (1998). Individual change after genocide in Bosnian survivors of "ethnic cleansing": Assessing personality dysfunction. *Journal of Traumatic Stress*, 11(1), 147–153.

- Wilson, J. P., & Droždek, B. (2007). Are we lost in translations?: Unanswered questions on trauma, culture and posttraumatic syndromes and recommendations for future research. In B. Droždek & J. P. Wilson (Eds.), Voices of trauma: Treating psychological trauma across cultures (pp. 367–386). New York, NY: Springer.
- Zayfert, C. (2008). Culturally competent treatment of posttraumatic stress disorder in clinical practice: An ideographic, transcultural approach. *Clinical Psychology: Science and Practice*, 15, 68–73.

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Correspondence regarding this article should be directed to Jackie June ter Heide, MA, MPhil (Cantab), Foundation Centrum '45, Nienoord 5, 1112 XE Diemen, the Netherlands. E-mail: j.ter.heide@centrum45.nl

# The Effectiveness of EMDR in Reducing Psychological Distress in Survivors of Natural Disasters: A Review

Fehmida Natha Anna Daiches Lancaster University

Natural disasters affect whole communities both at an individual level as well as economically and socially. However, the impact of natural disasters on an individual's mental health is substantial; yet, the response to one's mental health needs after a disaster is underdeveloped. Nevertheless, the Humanitarian Assistance Programme has attempted to address these needs by providing eye movement desensitization and reprocessing (EMDR) to natural disaster survivors. This systematic review provides evidence for the effectiveness and efficacy of EMDR in the treatment of psychological distress in survivors of natural disasters. Of the 8 studies reviewed, 4 were controlled trials and 1 study part-controlled. All the studies demonstrated statistical and clinical significance in reducing posttraumatic stress disorder (PTSD) symptoms, anxiety, depression, and other distress experienced by survivors of natural disasters. In addition, 4 of the 8 studies demonstrated clinical significance after just 1 session, presenting EMDR as resource-, time-, and cost-efficient intervention. Theoretical framework, adaptation in intervention, methodological issues, and quality assessment of studies are discussed. Implications for future research and clinical practice are also discussed.

Keywords: systematic review; EMDR; psychological distress; PTSD; natural disasters

atural disasters are events that cause extensive damage and significantly disturb the context of whole communities (Katz, Pellegrino, Pandya, Ng, & DeLisi, 2002). Exposure to a disaster is a complex phenomenon. They affect individuals directly through risk to their own life and individual loss and indirectly because of the shared community damage and the consequential economic, social, and governmental disruptions (Norris & Wind, 2009). Research has suggested that some disaster survivors experience trauma and psychological distress (Ursano, Fullerton, Weisaeth, & Raphael, 2007). Literature regarding the psychological impact of disasters has often focused on the posttraumatic stress disorder (PTSD) construct. Reasons for this focus include the understanding gained from animal models, regarding fear conditioning, that have allowed understanding of the biological mechanisms underlying trauma. Another reason relates to treatment interventions based on learning theory which are successful in helping trauma survivors (Kirmayer, Lemelson, & Barad, 2007).

Trauma experienced after a disaster can cause various negative outcomes. A comprehensive review of the impact of natural disasters by Murthy, Bertolote, and Epping-Jordan (2001, as cited in Gelbach, 2008) found that PTSD was observed in participants within 74% of studies, followed by depression, anxiety, and other forms of distress. As a response to the declining mental health of disaster survivors, the Humanitarian Assistance Programme (HAP) was formed (North, 2007). The HAP trains mental health practitioners around the world in eye movement desensitization and reprocessing (EMDR) to meet the long-term emotional needs of disaster survivors. The mental health response to a disaster may be the most crucial aspect involved in the process of recovery (Ursano et al., 2007). This review focuses on EMDR as a treatment for survivors of natural disasters experiencing psychological distress. Here, psychological distress refers to any impairment and negative emotions experienced by survivors.

# Psychological Distress in Survivors of Natural Disasters

The number of natural disasters occurring around the world has been increasing (Gelbach, 2008), and the death tolls for the most severe events have been profound. For example, the mortality rate for the 2004 Indian Ocean tsunami was more than 280,000 with an estimated further 100,000 individuals displaced by the event (Norris & Wind, 2009). Disasters resulting in higher death tolls yield higher postdisaster psychological distress. Rubonis and Bickman (1991) conducted a meta-analysis examining the relationship between disaster occurrence and psychological distress and found that there was a 17% increase in distress compared to the predisaster and control group. Furthermore, they found that increased death toll was strongly associated with psychological distress, explaining 20% of the variance when other factors were controlled for. It is likely that survivors of disasters with higher mortality rates are more likely to have had their own lives threatened, increasing the risk of psychological distress.

PTSD is the most prevalent diagnosis in survivors of natural disasters, with mental health services' response often targeting PTSD for intervention purposes. Symptoms of PTSD include negative reexperiencing, avoidance, emotional numbing, and hyperarousal (Terranova, Boxer, & Morris, 2009). Individuals receiving a diagnosis of PTSD may have had direct experience of the event or vicarious experience through witnessing others and exposure to horrifying images (North, 2007). A systematic review by Neria, Nandi, and Galea (2007) found postdisaster prevalence rates of PTSD to be substantial and concluded that it was the most common form of impairment in the aftermath of natural disasters. However, a recent review by Lo, Su, and Chou (2012) found that the association between PTSD and disasters varies widely. Specifically, the prevalence of PTSD in natural disaster survivors ranged from 8% to 34% in the 1999 Taiwan earthquake, 25% in the Turkey earthquake, and 74% in the 1988 earthquake in Armenia. Furthermore, research has also shown that specific vulnerability factors increase the risk of individuals developing psychological distress after natural disasters. These include being female (Garrison et al., 1995), preexisting mental health problems (Katz et al., 2002), low academic ability (La Greca, Silverman, & Wasserstein, 1998), lack of social support (Vernberg, Greca, Silverman, & Prinstein, 1996 as cited in North, 2007), and level of exposure (North, 2007). Accordingly, social cognitive theorists assert social support as a significant protective

factor against developing psychological distress. It is thought that helpful actions from other disaster survivors effectively model coping responses and provide encouragement for healthy adaptation (Benight & Bandura, 2004, as cited in Watson, 2007). This may reduce the likelihood of developing psychological distress.

However, apparent associations may be confounded by other associated risk factors (North, 2007). For example, North, Smith, and Spitznagel (1994) found low educational attainment to be related to PTSD in disaster survivors only because it was distinctive of women within the study who experienced PTSD symptoms more than males. Therefore, making causal inferences should be done so with caution. In addition, although research suggests that females are at increased risk for developing psychological distress, it is possible that males self-medicate more as an adaptive coping mechanism. This may make the detection of psychological distress in male survivors less likely. For example, Pollice, Bianchini, Roncone, and Casacchia (2011) administered a survey to 1,078 survivors of an earthquake in Italy. They found significant correlations between disaster exposure and substance misuse in males.

Moreover, psychological distress in survivors includes major depressive disorder and generalized anxiety disorder (Kar & Bastia, 2006). The first 3 months in particular is the most significant risk period of developing depression (Katz et al., 2002). Level of exposure to the disaster also increases the risk of developing depression as well as prior stressful life events (Kendler, Karowski, & Prescott, 1998). Anxiety disorders such as panic and phobic disorders may also be experienced by survivors (Terranova et al., 2009). The cooccurrence of two or more mental health problems is also increasingly common. For example, Fan, Zhang, Yang, Mo, and Liu (2011) examined psychological distress in 2,250 adolescents 6 months after an earthquake in China. They found PTSD, anxiety, and depression often cooccurred in survivors. However, one of the major limitations of this study is the unavailability of data regarding preexisting mental health within the sample making it difficult to identify whether the disaster alone contributed toward symptoms.

#### Acute Interventions in Reducing Psychological Distress in Survivors of Natural Disasters

Psychological debriefings have been defined as group discussions which occur within 48–72 hours after a

traumatic event (Katz et al., 2002). The sessions encourage participants to explore thoughts, reactions, and coping strategies following a traumatic event (Watson, 2007). Debriefing after disasters is based on the belief that immediate processing of the event allows opportunity for survivors to cognitively structure the event accurately so that it is recalled in a less distressing manner (Watson, 2007). However, some research suggests that debriefing may be ineffective or even harmful, increasing the risk of developing longterm psychological symptoms (Bisson & Deahl, 1994). This has led some to suggest that it should be discontinued as an intervention (Bisson & Deahl, 1994).

In contrast, some evidence exists to support cognitive behavioral therapy (CBT) in reducing symptomology associated with traumatic events (Seidler & Wagner, 2006). Similarly, De Roos et al. (2011) conducted a randomized comparison of CBT and EMDR to establish the effectiveness of both interventions in reducing trauma-related symptoms in children exposed to disasters. Although both approaches produced significant reductions in depression, anxiety, and PTSD symptoms, treatment gains of EMDR were reached in fewer sessions.

However, Hobfoll's (1989, as cited in Lo et al., 2012) conservation of resources (COR) theory posits resource loss is an important factor related to individual stress and mental health. Intervention implications from this theory suggest that an important part of the recovery process includes psychological and social resource investment (Watson, 2007). To what extent the aforementioned interventions tackle resource investment remains unclear.

#### Use of EMDR in the Treatment of Psychological Distress in Survivors of Natural Disasters

EMDR is a structured treatment intervention based on the adaptive information processing (AIP) model emphasizing the brain's memory storage and information processing system (Shapiro & Maxfield, 2002). The model hypothesizes that the basis of current psychological distress are the emotions and physical sensations related to the unprocessed traumatic event and their inappropriate storage within the memory system (Van Rood & de Roos, 2009). EMDR involves requesting the client to recall specific memories of the traumatic event while following the therapist-directed hand movements. It is thought that the bilateral stimulation and accessing the unprocessed trauma activates the brain's processing system and facilitates the assimilation of the traumatic memory into the larger memory network (Solomon & Shapiro, 2008). Thus, the traumatic memory is no longer isolated, allowing adaptive processing to occur as a result of the new associations made within the brain.

Meta-analyses have established the efficacy of EMDR in the treatment of PTSD (Bisson & Andrew, 2009; Davidson & Parker, 2001). Equally, Roos, Benjamin, de Roos, Meijer, and Stams (2009) conducted a meta-analysis examining the efficacy of EMDR in children and found that EMDR is a beneficial treatment intervention. Furthermore, EMDR showed a small incremental value relative to children treated with CBT. In relation to disasters, EMDR has demonstrated effectiveness in reducing psychological distress including PTSD symptoms (Chemtob, Nakashima, & Carlson, 2002; Fernandez, Gallinari, & Lorenzetti, 2004), anxiety, depressive feelings, and fear. For example, Jayatunge (2008) illustrated that symptoms experienced in seven survivors of the 2004 tsunami such as depressive feelings, anxieties, intrusions, and nightmares were significantly reduced after EMDR. Psychosocial functioning was also restored after treatment, allowing survivors to lead productive lives. EMDR is also established as an efficient treatment intervention. For example, Ichii (1997) described a case where two female survivors of an earthquake, experiencing psychological distress, were successfully treated after a single session of EMDR. These effects were maintained at five months' follow-up.

## **EMDR-Related Protocols**

What is referred to as "EMDR" occasionally varies between publications. Although the acronym suggests the use of the standard protocol, they are sometimes adapted. An example of an EMDR-related protocol in the field of natural disasters is used by Jarero, Artigas, and Hartung (2006) referred to as the EMDR Integrative Group Treatment Protocol (EMDR-IGTP). This was designed as a response to large-scale disasters and combined the eight standard EMDR sessions within a group therapy model, offering widespread reach to survivors of disasters. Another adaptation is the EMDR Protocol for Recent Critical Incidents (EMDR-PRECI). Differences between this and the standard protocol include asking the client to describe the traumatic event in a narrative form and conceptualizing the disaster as an extended event with a continuum of important marker incidents as an ongoing traumatic event rather than several separate events (Jarero, Artigas, & Luber, 2011). Moreover, the EMDR-PRECI primarily uses the butterfly hug (alternate tapping of crossed arms over the chest) and eye movements for bilateral stimulation, whereas the standard protocol uses various forms of bilaterals. Some studies have also offered computerized EMDR (Abbasnejad, Mehani, & Zamyad, 2007). A bilateral stimulation software written by Manfield and Manfield (2002, as cited in Abbasnejad et al., 2007) called "There and Back" is a package offering visual, auditory, or tactile stimulation modes.

# **Rationale of the Present Review**

Despite the fact that meta-analyses have confirmed the effectiveness of EMDR, the reviews have focused on PTSD only and have not been specific to natural disasters. As discussed, disaster survivors can sometimes experience various negative emotions. Furthermore, because of the increasing number of disasters around the world and the need to meet the emotional needs of disaster survivors, a specific review for natural disasters is warranted. In addition, because of cost and time issues, EMDR for survivors of natural disasters requires systematic evidence in order for it to be proposed as a viable and effective intervention within a disaster context.

## Method

#### Selection of Studies

A search was conducted for published reports of EMDR for survivors of natural disasters. A three-step search strategy was employed for purposes of this systematic review. Initially, studies were searched from computerized databases, within the Journal of EMDR Practice and Research and the "Francine Shapiro Library" online. Secondly, the ancestry method was used to find additional studies on EMDR for survivors of natural disasters in the reference section of reviews, meta-analyses, and articles reporting on empirical studies. The final stage involved contacting the librarian of the Francine Shapiro Library and the United Kingdom president of the EMDR association enquiring whether they had access to any recently submitted articles within the area of natural disasters. An EMDR training manual with a list of all peer-reviewed EMDR related articles was also used.

A systematic literature search for relevant studies was conducted in five major bibliographical databases: PsychINFO, CINAHL, Medline, Academic Search Complete, and Science Direct. For all databases, three key concepts were used: "eye movement desensitization and reprocessing/EMDR" OR "psychological distress" AND "natural disasters." Extensive word variants were used for the three concepts and were used interchangeably. The search included the following terms for specific psychological distress: "posttraumatic stress/PTSD" OR "stress" OR "trauma" OR "anxiety" OR "depression" OR "negative emotion" OR "fear" OR "grief" OR "intrusive thoughts" OR "psychopathology." Word variants for natural disasters were "critical incident" OR "crisis" OR "flood" OR "tsunami" OR "earthquake" OR "volcano" OR "hurricane." EMDR word variants were "EMD" OR "EMDR-PRECI" OR "EMDR Group Protocol" OR "EMDR-IGTP."

All abstracts were examined and studies potentially meeting the inclusion criteria were retrieved and examined more extensively.

### Selection Criteria

Studies included in this systematic review were all quantitative studies measuring the effectiveness of EMDR in survivors of natural disasters. The decision to search only studies published in peer-reviewed and complete articles was made prior to searching between 1989 (inception of EMDR) and 2012. Specific criteria for inclusion were the following: (a) randomized and controlled trials (RCT), (b) nonrandomized and noncontrolled trials if they included either validated outcome measures or used thorough self-report instruments, (c) peer-reviewed articles available in English only, (d) use of the standard EMDR protocol as well as EMDR-related protocols, and (e) studies delivering EMDR to survivors of natural disasters experiencing various forms of psychological distress.

Excluded were non-peer-reviewed articles. This included case studies, editorials, and special issues. Articles were further excluded if they described EMDR as a treatment intervention for man-made disasters.

Of the 33 identified articles, 25 did not fulfill the inclusion criteria. These papers were either theoretical or discussion papers, case studies, or not published in peer-reviewed journals. Studies unrelated to the topic of this review, namely those falling under the man-made disaster category, were further excluded. Two studies were excluded based on not having the full text available in English and not providing any statistical analyses or reporting the values/means of outcome measures. Eight studies remained for purposes of this review.

## Assessment of Quality

In this review, the quality of the studies was rated using the Revised Gold Standard (RGS) scale, predefined criteria used for evaluating methodology in treatment outcome research. Initially developed by Foa and Meadows (1997) with seven gold standard (GS) items, Maxfield and Hyer (2002) revised the original GS scale by adding an additional three items. These were considered to provide further unique elements, allowing more accurate measurements of methodological shortcomings. As this review examined psychological distress (including PTSD), the original GS 1 and GS 10 were not included as part of the quality criteria because these items specifically measured PTSD. Therefore, eight GS items remained (see Table 1).

These criteria were scored using a 3-point Likert scale for each item: a score of 1 was given to a study that fully met the criteria, 0.5 was given when a study partially met the criteria, and 0 to a study that did not meet the specific criteria. The total possible score on the adapted RGS scale was 8. A study was considered to be of "high quality" with a score of 6 or more points, of "moderate quality" with a score of 4–5 points, and of "low quality" if a study scored less than 4 points.

GS 1	Reliable and valid measures
	0 : did not use reliable and valid measures
	.5: measures used inadequate to measure change
	1 : reliable, valid, and adequate measures
GS 2	Use of blind independent assessor
	0 : assessor was therapist
	.5: assessor was not blind
	1 : assessor was blind and independent
GS 3	Assessor reliability
	0 : no training in administration of instruments used in the study
	.5: training in administration of instruments used in the study
	1 : training with performance supervision, or reliability checks
GS 4	Manualized, replicable, specific treatment
	0 : treatment was not replicable or specific
	1 : treatment followed EMDR training manual, Shapiro 1995
GS 5	Unbiased assignment to treatment
	0 : assignment not randomized
	.5: only one therapist, OR semi-randomized designs
	1 : unbiased assignment to treatment
GS 6	Treatment adherence
	0 : treatment fidelity poor
	.5: treatment fidelity unknown, or variable
	1 : treatment fidelity checked and accurate
GS 7	No confounded conditions
	0 : most subjects receiving concurrent psychotherapy
	.5: a few subjects receiving concurrent psychotherapy, or unspecified and no exclusion for current treatment
	1 : no subjects receiving concurrent psychotherapy
GS 8	Use of multimodal measures
	0 : self-report measures only
	.5: self-report plus interview or physiological or behavioral measures
	1 : self-report plus two or more other types of measures

#### TABLE 1. The Adapted Revised Gold Standard Scale

*Note*. GS = Gold Standard. Adapted from "The Relationship Between Efficacy and Methodology in Studies Investigating EMDR Treatment of PTSD," by L. Maxfield and L. Hyer, 2002, *Journal of Clinical Psychology*, *58*, p. 31.

# Results

# Type of Studies

The eight studies consisted of four RCTs (Abbasnejad et al., 2007; Chemtob et al., 2002; Grainger, Levin, Allen-Byrd, Doctor, & Lee, 1997; Jarero et al., 2011), one part-controlled study (Konuk et al., 2006), and three uncontrolled studies (Aduriz, Bluthgen, & Knopfler, 2011; Fernandez, 2007; Jarero et al., 2006). The one part-controlled study compared the posttreatment scores of the early-treated group with the pretreatment scores of the late-treated group. The four RCTs used a waitlist/delayed-treatment control group. Refer to Table 2 for an overview of the study characteristics.

# Designs

All studies used a pretest–posttest design and collected follow-up data. However, only 21 participants were available at follow-up for one study (Konuk et al., 2006) from the 41 initially treated. The period of follow-up measurements ranged from 1 month to 1 year.

# Participants

The total sample in this review composed of 362 participants. The gender of participants was stated in all studies, besides that of Fernandez (2007) who treated 22 participants. Of the remaining 340 participants, 147 were males and 193 were females. The age range was 6–80 years, with four studies targeting child survivors only (Aduriz et al., 2011; Chemtob et al., 2002; Fernandez, 2007; Jarero et al., 2006), who were all recruited through their schools.

# Type of Psychological Distress and Preexisting and Cooccurrence of Mental Health

The type of psychological distress in participants varied from clinical diagnosis of PTSD (Chemtob et al., 2002; Fernandez 2007; Konuk et al., 2006), participants presenting with PTSD symptoms as indicated by selfreport measures (Aduriz et al., 2011; Grainger et al., 1997; Jarero et al., 2006; Jarero et al., 2011), or both diagnosed PTSD/PTSD symptoms as well as anxiety and depressive symptoms (Abbasnejad et al., 2007; Chemtob et al., 2002). Abbasnejad et al. (2007) also included participants presenting with phobia, grief, fear, and other "unpleasant emotions." However, it is unclear whether this was assessed by clinicians prior to referral for EMDR treatment or self-reported symptoms. The duration of the symptoms in participants varied from 2 weeks (Jarero et al., 2011) after the disaster (where the aim was to deliver EMDR as an early intervention) to  $3 \ 1/2$  years (Chemtob et al., 2002), where a previous psychotherapy treatment administered 1 year prior was ineffective in reducing stress symptoms.

No studies reported on both preexisting and the cooccurrence of two or more mental health problems besides Jarero et al. (2006). The authors gathered a full clinical history from parents and teachers of the participants. However, the study did not explicitly state which additional symptoms besides PTSD these children were experiencing or the nature of the preexisting mental health problem. Furthermore, Konuk et al. (2006) set to exclude all participants who exhibited psychosis, exhibited dissociative disorders, or posed a risk to themselves and others. However, these were not detected within the participant pool. Moreover, Fernandez (2007) only used an assessment of PTSD supported by the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-1). Overall, the reporting of preexisting and the cooccurrence of mental health problems was relatively poor across studies.

*Single or Combined Treatment.* No studies besides that of Konuk et al. (2006) reported whether or not their participants received additional treatment along-side EMDR. Specifically, within their pool, some participants were on prescribed medication prior or during treatment. Nonetheless, five of the six participants on medication spontaneously discontinued use between the treatment and follow-up. Statistical analyses further indicated that medication had no additive or detrimental impact on EMDR treatment.

# Results of the Studies

Overall, EMDR demonstrated statistical and clinical significance in reducing psychological distress across studies. Significant differences were found between pretreatment, posttreatment, and follow-up mean scores (refer to Table 3).

*Attrition.* No participants declined treatment across the studies. There was no attrition in four studies (Abbasnejad et al., 2007; Grainger et al., 1997; Jarero et al., 2006; Jarero et al., 2011) with participants completing the full treatment programme. Within the Aduriz et al. (2011) and Chemtob et al. (2002) studies, 2 people dropped out and 2 did not complete treatment, respectively. Within the Fernandez (2007) and Konuk et al. (2006) studies, 3 people dropped out and 10 people dropped out and 7 did not complete treatment, respectively. These 7 did not complete posttreatment outcome measures even though they

TABLE 2. Ch	aracteristics of the	e Studies in the Pr	esent Review						
Authors	Disaster	Ν	Study Type	Type of Psychological Distress	EMDR Protocol	Number of Treatment Sessions	Measures Used	Follow-up	Makes Claim Regarding Effectiveness
Abbasnejad et al. (2007)	Earthquake, Bam, Iran	41	Randomized controlled trial	PTSD symptoms, anxiety, de- pression, fear, phobia, grief, and other unpleasant feelings	Computerized EMDR ("There and Back")	4	BDI, BAI, and SUD	1 month	Yes, if appropriate
Aduriz et al. (2011)	Flood, Sante Fe, Argentina	124	Uncontrolled	PTSD symptoms	EMDR-IGTP	1	CRTES, SUD	3 months	Yes, if appropriate
Chemtob et al. (2002)	Hurricane Iniki, Hawaii	32	Randomized controlled trial	PTSD, anxiety, and depression	Standard protocol	$\tilde{c}$	CRI, RCMAS, CDI	6 months	Yes, if appropriate
Fernandez (2007)	Earthquake, Molise, Italy	22	Uncontrolled field study	PTSD	Standard protocol	×	SCID-1 supported assessment	1 year	Yes, if appropriate
Grainger et al. (1997)	Hurricane Andrew, Florida	40	Randomized con- trolled trial	PTSD symptoms	Standard protocol	1	IES, SUD	1 and 3 months	Yes, if appropriate
Jarero et al. (2006)	Flood, Mexico	44	Uncontrolled field study	PTSD symptoms	EMDR-IGTP	1	CRTES SUD	1 month	Yes, if appropriate
Jarero et al. (2011)	Earthquake, Mexico	18	Randomized controlled field study	PTSD symptoms	EMDR-PRECI	1	IES	3 months	Yes, if appropriate
Konuk et al. (2006)	Earthquake, Marmara, Turkey	41 (21 available at follow-up)	Part-controlled	PTSD	Standard protocol	Ŋ	PSS-SR, SUD, VOC	6 months	Yes, if appropriate
<i>Note.</i> BDI = 1 Reaction Inventc of Events Scale; F	Beck Depression Inver ory; RCMAS = Revise PSS-SR = PTSD Symp	ntory; BAI = Beck Aı ed Children's Manifes otom Scale-Self-Repo	nxiety Inventory; SUD = st Anxiety Scale; CDI = ( ort; VOC = Validity of C	= Subjective Units of D Child Depression Inver Ognitions.	isturbance; CRTES = C ntory; SCID-1 = Structu	Child's Reaction ared Clinical Inte	to Traumatic Even erview for DSM-IV	ts Scale; CRI = ( Axis I Disorders	Children's IES = Impact

TABLE 3. Mean Scores of Outcome Measures at Pretreatment, Posttreatment, and Follow-up

			¢		Doctroc	140044	$E_{010}$		
			Pretrea	itment	LUSUIC		LOIIO	dn-w	
Authors	Measures	Condition	М	SD	М	SD	М	SD	Significance
Abbasnejad et al. (2007)	BDI	Experimental	33.51	6.63	16.42	4.54	15.42	5.75	p < .001
		Delayed	34.45	6.56	31.55	8.84			
	BAI	Experimental	33.80	5.69	16.19	6.54	13.57	6.27	p < .001
		Delayed	33.60	7.02	31.8	8.58			
	SUD	Experimental	7.19	1.36	2.57	1.03	2.21	1.32	p < .001
		Delayed	7.37	1.03	6.40	2.12			
Aduriz et al. (2011)	CRTES	Experimental	26.40				10.80		p < .001
	SUD	Experimental	7.20		2.19				p < .001
Chemtob et al. (2002)	CRI	Experimental	36.54	11.57	16.47	12.98	10.59	8.23	p < .001
		Delayed	39.60	21.04	22.60	20.21	18.87	20.39	
	RCMAS	Experimental	18.00	5.87	14.29	8.26	10.00	8.28	p < .001
		Delayed	18.07	8.17	11.78	10.99	13.57	9.47	
	CDI	Experimental	55.94	9.86	48.71	13.03	48.35	14.22	p < .01
		Delayed	59.73	19.84	53.87	21.82	51.67	18.34	
Fernandez (2007)	SCID-1 supported	Experimental							p < .01
	assessificiti								
Grainger et al. (1997)	IES	Experimental	37.39		21.60		24.33		p < .001
		Delayed	18.73		21.57				
	SUD	Experimental	7.72	1.58	1.94	2.05			p < .001
		Delayed	34.36		37.91				
Jarero et al. (2006)	CRTES	Experimental	32.77				8.27		Clinically significant
	SUD	Experimental	9.24		1.29				
Jarero et al. (2011)	IES	Experimental	54.22	11.00	24.89	4.83	22.67	4.85	p < .001
		Delayed	55.67	8.37	49.22	8.03	22.78	5.47	
Konuk et al. (2006)	PSS-SR	Combined means of early- and late-treated group	34.29	7.96	5.37	4.76	7.76	7.79	p < .001
	SUD	Combined	8.15	2.21	0.42	0.79			p < .01
	VOC	Combined	2.34	1.44	6.42	1.08			

continued with the therapy. Accordingly, these studies only included within the analyses the participants who completed pre- and postmeasures and the full treatment programme. Furthermore, Konuk et al.'s (2006) was the only study that attempted to follow-up participants who did not complete the programme. Within the Jarero et al. (2011) study, EMDR was only administered to the 18 adults who scored higher than 44 on the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) after an initial crisis management briefing intervention to 53 company employees.

Outcome Measures. All studies used one or a combination of primary and secondary outcome measurements. Three studies (Chemtob et al., 2002; Fernandez 2007; Konuk et al., 2006) ensured PTSD status in participants through the PTSD Symptom Scale-Self-Report (PSS-SR; Foa et al., 1993), the Child Reaction Index (CRI; Pynoos et al., 1987), and a directly administered questionnaire prepared by the National Institute of Health and Clinical Excellence (NICE, 2005) supported by the SCID-1. However, Konuk et al. (2006) do not indicate the name of the assessment. The CRI is a clinician-administered interview for assessing PTSD in children and has good test-retest reliability and an alpha level of .87 within Chemtob et al.'s (2002) study. Abbasnejad et al. (2007) used the Persian version of the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI) as secondary outcome measures.

Moreover, four studies (Aduriz et al., 2011; Grainger et al., 1997; Jarero et al., 2006; Jarero et al., 2011) used the IES or the children version of the scale: the Child's Reaction to Traumatic Events Scale (CRTES; Jones, 1997). These self-report measures assess the intrusion and avoidance clusters of PTSD. The IES and the CRTES demonstrate high test–retest reliability, validity, and good internal consistency. Some studies also included additional "process measures"—the Subjective Unit of Disturbance (SUD) scale and Validity of Cognitions (VOC) scores where participants were assessed on these measures at various points of the treatment. Of the studies that used the same measures, there were differences in the times at which the measure was given (either before and after each treatment session only or repeatedly after each EMDR phase). This methodological issue limits any comparisons that can be made between study findings.

Statistical Analyses. Of the four RCTs and one part-controlled study, analysis of between-group differences and within-group differences indicated that EMDR was effective in reducing psychological distress. Four studies used analysis of variance (ANOVA; Aduriz et al., 2011; Chemtob et al., 2002; Grainger et al., 1997; Konuk et al., 2006), two studies used t tests (Abbasnejad et al., 2007; Jarero et al., 2011), and one study used a Wilcoxon matched-pairs signed rank test (Fernandez 2007). The remaining study only reported the means, concluding EMDR as clinically significant (Jarero et al., 2006). In addition, Chemtob et al. (2002) also measured the number of visits by the school nurse after treatment and the children's perception of the helpfulness of treatment. Fernandez (2007) did not report any means and standard deviations, only providing the statistical significance of the comparison of the first and last measure.

#### Quality Assessment

The assessment of methodological quality is presented in Table 4. The overall quality of the studies was "high" to "moderate." Four studies were rated as "high" quality (Chemtob et al., 2002; Fernandez 2007; Jarero et al., 2011; Konuk et al., 2006). The four

Authors	#1	#2	#3	#4	#5	#6	#7	#8	Quality Score
Abbasnejad et al. (2007)	1	0	.5	0	1	.5	.5	0	3.5
Aduriz et al. (2011)	1	0	.5	0	0	.5	.5	0	2.5
Chemtob et al. (2002)	1	0	1	1	1	1	.5	1	6.5
Fernandez (2007)	1	1	1	1	0	1	.5	.5	6
Grainger et al. (1997)	1	0	1	1	1	.5	.5	.5	5.5
Jarero et al. (2006)	1	0	.5	1	0	1	.5	0	4
Jarero et al. (2011)	1	0	1	1	1	1	1	0	6
Konuk et al. (2006)	1	0	1	1	.5	1	.5	1	6

 TABLE 4.
 Quality Assessment of Selected Studies Using the Revised Gold Standard Scale

studies were controlled or part-controlled and used two or more well-validated measures. In addition, the four studies delivered the treatment as per the standard protocol (Shapiro, 1995) manual allowing easy replication of the study. In particular, Fernandez (2007) was the only study to implement blind evaluators for purposes of diagnosis and assessment, thus reducing expectancy and demand biases into the evaluation. The two studies which were rated as "low" quality (Abbasnejad et al., 2007; Aduriz et al., 2011) implemented an adapted version of the standard protocol and used self-report measures only. Two studies were also uncontrolled studies. All but one study scored .5 on RGS 7 because they did not specify if participants were receiving concurrent psychotherapy or did not indicate this as part of the exclusion criteria. Half the studies relied on self-report measures only. Some studies did not clearly comment on how the authors ensured treatment fidelity or the level of training of assessors. However, because the practitioners were members of a mental health response team, it is assumed that the level of training would be sufficient enough to deliver EMDR and would ensure adherence to the treatment programme. Thus, these studies were awarded a score of .5.

Furthermore, only two studies reported on confounding factors such as gender (Aduriz et al., 2011) and education (Konuk et al., 2006). Scores for SUD's were significantly higher for girls than boys, and low educational attainment was inversely correlated to pretreatment intrusive imagery, hypervigilance, and nightmares. No studies commented on power issues or reported effect sizes. Although all studies demonstrated the effectiveness of EMDR (both statistically and clinically significant), most studies relied on sample sizes of less than 45. Therefore, the reporting and discussion of power and effect sizes would have been important.

## Discussion

#### Summary of Findings

This systematic review provides evidence for the effectiveness and efficacy of EMDR in reducing psychological distress in survivors of natural disasters. This conclusion is based on eight studies: four RCTs, one part-controlled, and three uncontrolled studies. Although, most of the studies focused on PTSD symptoms, the findings are not restricted to this presentation alone. Statistical and clinical significance was shown in reducing anxiety, depression, fear, grief, and phobia. In addition, four of the eight studies targeted child survivors, allowing the findings to be generalized across age groups. All studies implemented a pretest–posttest design and gathered followup data. Results were maintained at follow-up where many of the participants would have been experiencing the aftershocks of the disaster. This is in line with Shapiro's (2001) AIP model: Adequately processing a traumatic event alters how this memory is stored within memory network so that a trauma is no longer triggered by a similar event.

Moreover, the number of EMDR sessions were relatively short, ranging from one to eight, reducing the likelihood that other factors (e.g., change in life circumstances) influenced the outcome of these studies. Some of the studies within this review administered only one session of the standard or related protocols, which suggests EMDR is a time- and costeffective treatment in reducing psychological distress within the context of a natural disaster. This review therefore demonstrates EMDR as a viable treatment option in response to a disaster crisis.

Nevertheless, because three studies were uncontrolled and one part-controlled, whether or not the observed effects were a placebo effect or caused by spontaneous recovery cannot be dismissed. However, the likelihood of this is minimized because participants within the studies experienced symptoms ranging from 2 weeks to 3 1/2 years postdisaster. Furthermore, two studies (Chemtob et al., 2002; Jarero et al., 2011) specified that their participants received a previous psychotherapy (1 year before) or a crisis management briefing, which were both ineffective in reducing psychological distress. Therefore, EMDR can be considered more effective than other trauma processing interventions.

#### Limitations of the Present Research

Although RCTs provide the most valid information in treatment outcome studies, within natural disaster research, this would be difficult to operationalize because of the ethical and logistical constraints. Yet, four of the eight studies within this review were controlled, which employed a waitlist/delayed-treatment design. Nevertheless, a recurrent criticism of waitlist designs is that they do not adequately control for demand characteristics, potentially implying that any intervention is better than no intervention. This issue is only mitigated within the studies that stated previous psychotherapy as ineffective (as the symptoms were persistent).

Second, four studies (three of which were rated as high quality) reported some participants dropped out of the study or did not complete the treatment within their samples. Thus, they only included participants within the statistical analyses who completed the full treatment programme. Consequently, this introduces selection bias into the results favoring the intervention and minimizes the external validity of these studies. Future research should implement an intention-to-treat methodology, including participants not completing the full treatment programme within the analyses. This would maintain the validity of the study. Because of these limitations, confidence in drawing inferences from the studies is minimized.

Furthermore, the reporting of confounding factors was poor across studies with the exception of Aduriz et al. (2011) and Konuk et al. (2006). Lack of education has been associated with increased vulnerability within a disaster context (Garrison et al., 1995), and Konuk et al. (2006) found that less education was associated with more negative outcomes. The knowledge gained from education may protect an individual from feelings of loss and lack of control and provide a better sense of coping. Because four of the studies composed of child participants recruited through schools, a certain level of education is assumed. Hence, the discussion of education would have been helpful because education variables may have interacted with the effectiveness of the treatment. However, it is acknowledged that collecting information on education would be very difficult within a disaster setting. These issues will be discussed later.

Similarly, social/family support is considered as a significant protective factor against developing psychological distress (Vernberg et al., 1996) and no studies controlled for this variable. Nonetheless, Fernandez (2007) allowed parents to attend EMDR sessions with children. Therefore, controlling for this variable would have been integral because the support provided by adults during therapy may have facilitated the recovery process. However, because disasters affect families and whole communities, the anxieties of parents and other adults could be transferred to children, potentially causing further distress. Allowing parents to remain present in the treatment process may have been beneficial in this instance. This was also considered in Aduriz et al.'s (2011) study where debriefing and psychoeducation were provided to parents, teachers, and school authorities. In relation to social cognitive theory (Benight & Bandura, 2004, as cited in Watson, 2007), the proactive role of significant others within the treatment programme may be important. It can promote and maintain successful resolution of distress, and adults can model effective coping responses to children (Watson, 2007).

In addition, no studies reported on preexisting mental health besides Jarero et al. (2006), and one study ensured the exclusion of participants with specific presentations. Although studies demonstrated statistical and clinical significance, a proportion of participants remained within the high-stress category at follow-up in some studies. Data regarding previous unprocessed traumatic memories and preexisting mental health would therefore have been helpful to ascertain how previous trauma may have impeded the EMDR intervention.

# Clinical Implications and the Challenges of Working Within a Natural Disaster Context

Statistical and clinical significance was demonstrated across all studies, with four studies rated as high quality. Although the remaining studies were rated as either moderate or low quality, the challenges of responding to victims' mental health needs within a natural disaster context limit the ability to increase the methodological quality of the studies as per the RGS criteria. For example, there are limited resources after natural disasters (Gelbach, 2008), thus arranging for blind evaluators and a range of measures (besides self-report) would be difficult.

Moreover, the priority for mental health response after a natural disaster is to attend to the primary mental health needs of victims and to provide psychoeducation and stabilization, which are considered to be effective in reassuring overwhelmed victims and allow processing of traumatic memories, respectively (Gelbach, 2008). As such, obtaining full clinical histories, gauging preexisting mental health difficulties, and establishing whether victims are receiving concurrent psychotherapy would be an impossible task when working with distressed, overwhelmed, and displaced individuals. Therefore, taking into account the context in which EMDR practitioners are working within, it can be recommended that the use of the standard protocol, guaranteeing a good level of training of the practitioners, and ensuring that they receive regular supervision can aid the effectiveness of EMDR. Gelbach (2008) also suggests that supervisors and researchers should make concerted effort to delineate new research and findings to practitioners which can be implemented within practice. Despite the methodological shortcomings of the studies reviewed, this review still highlights that EMDR is an efficacious treatment in response to the mental health needs of natural disaster victims.

Furthermore, research suggests that females present with increased vulnerability within a disaster context because of the gender division of labor, low socioeconomic status, and the lack of political influence (Garrison et al., 1995). Aduriz et al. (2011) was the only study to report on gender differences, with females more vulnerable to traumatic stress than males. Female vulnerability is further heightened in the face of a disaster, when caregiving demands increase and resources decrease. Hence, mental health response should ensure this population is targeted and deliver gender-fair practice.

Although this review demonstrates the effectiveness of EMDR in survivors of natural disasters, Hobfoll's (1989, as cited in Lo et al., 2012) COR theory states that an important part of the recovery process includes social resource investment. Interventions often focus at the individual level, whereas disasters cause widespread damage, affecting communities, larger society, and the structural context in which survivors live. Although EMDR does not specifically target the wider ecology of disasters, it can be argued that stable mental health can increase an individual's ability to help in the disaster response and the rebuilding of communities thereafter. A case study (Jayatunge, 2008) illustrates this, where EMDR restored psychosocial functioning allowing survivors to lead productive lives.

### Conclusions

This review provides evidence for the effectiveness and efficacy of EMDR in reducing psychological distress in survivors of natural disasters. All studies reviewed demonstrated statistical and clinical significance in reducing psychological distress in survivors of natural disasters. Nevertheless, studies were mediocre in methodology and design, which reduced the overall "quality" of the studies. However, as noted previously, the nature of disasters makes some of the RGS criteria difficult to operationalize. This includes the use of blind evaluators, using a range of measures besides self-report measures, and the reporting of preexisting mental health problems and concurrent psychotherapy. Despite these limitations, the benefit of EMDR in restoring mental health functioning in the plight of a real-life crisis and presenting as a resource-, time-, and cost-efficient intervention mitigates some of these issues. The effectiveness of EMDR is further highlighted where previous intervention in two studies did not resolve psychological distress in survivors. Overall, the findings of this review suggest that EMDR should most certainly be considered as a treatment intervention by mental health response after natural disasters.

# References

- Abbasnejad, M., Mehani, N. K., & Zamyad, A. (2007). Efficacy of "eye movement desensitization and reprocessing" in reducing anxiety and unpleasant feelings due to earthquake experience. *Psychological Research*, *9*, 104–117.
- Aduriz, M. E., Bluthgen, C., & Knopfler, C. (2011). Helping child flood victims using group EMDR intervention in Argentina: Treatment outcome and gender differences. *International Perspectives in Psychology, Research, Practice, Consultation, 1, 58–67.* http://dx.doi. org/10.1037/2157-3883.1.S.58
- Bisson, J., & Andrew, M. (2009). Psychological treatment of post-traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews 2009, 3,* 1–99. http://dx.doi. org/10.1002/14651858.CD003388.pub3
- Bisson, J. I., & Deahl, M. P. (1994). Psychological debriefing and prevention of posttraumatic stress—More research is needed. *British Journal of Psychiatry*, *165*, 717–720. http://dx.doi.org/10.1192/bjp.165.6.717
- Chemtob, C. M., Nakashima, J., & Carlson, J. G. (2002). Brief treatment for elementary school children with disaster-related posttraumatic stress disorder: A field study. *Journal of Clinical Psychology*, *58*, 99–112. http:// dx.doi.org/10.1002/jclp.1131
- Davidson, P. R., & Parker, K. C. H. (2001). Eye movement desensitization and reprocessing (EMDR): A metaanalysis. Journal of Consulting and Clinical Psychology, 69, 305–316. http://dx.doi.org/10.1037/0022-006X.69.2. 305
- De Roos, C., Greenwald, R., den Hollander-Gijsman, M., Noorthoorn, E., van Buuren, S., & de Jongh., A. (2011). A randomised comparison of cognitive behavioural therapy (CBT) and eye movement desensitisation and reprocessing (EMDR) in disaster exposed children. *European Journal of Psychotraumatology*, *2*, 1–11. http://dx.doi .org/10.3402/ejpt.v2i0.5694
- Fan, F., Zhang, Y., Yang, Y., Mo, L., & Liu, X. (2011). Symptoms of posttraumatic stress disorder, depression, and anxiety among adolescents following the 2008 Wenchun earthquake in China. *Journal of Traumatic Stress Studies*, 24, 44–53. http://dx.doi.org/10.1002/jts.20599
- Fernandez, I. (2007). EMDR as treatment of post-traumatic reactions: A field study on child victims of an earthquake. *Educational and Child Psychology*, *24*, 65–73. Retrieved from http://www.coe.int/t/dg4/majorhazards/ ressources/virtuallibrary/materials/italy/ECP%20 fernandez.pdf
- Fernandez, I., Gallinari, E., & Lorenzetti, A. (2004). A school-based EMDR intervention for children who witnessed the Pirelli Building airplane crash in Milan, Italy. *Journal of Brief Therapy*, *2*, 129–136. Retrieved from http://scholar.google.co.uk/scholar?hl=en&q=A+sch oolbased+EMDR+intervention+for+children+who+ witnessed+the+Pirelli+Building+airplane+crash+in+ Milan%2C+Italy&btnG=&as\_sdt=1%2C5&as\_sdtp

- Fernandez, I. (2007). EMDR as treatment of post-traumatic reactions: A field study on child victims of an earth-quake. *Educational and Child Psychology, 24*, 65–73.
- Foa, E. B., & Meadows, A. (1997). Psychosocial treatments for posttraumatic stress disorder: A critical review. *Annual Review Psychology*, 48, 449–480. http://dx.doi .org/10.1146/annurev.psych.48.1.449
- Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. *Journal of Traumatic Stress*, 6, 459–473.
- Garrison, C. Z., Bryant, E. S., Addy, C. L., Spurrier, P. G., Freedy, J. R., & Kilpatrick, D. G. (1995). Posttraumatic stress disorder in adolescents after Hurricane Andrew. Journal of the American Academy of Child and Adolescent Psychiatry, 34, 1193–1201. http://dx.doi.org/ 10.1097/00004583-199509000-00017
- Gelbach, R. A. (2008). Trauma, research, and EMDR: A disaster responder's wish list. *Journal of EMDR Practice and Research*, *2*, 146–155. http://dx.doi.org/10.1891/1933-3196.2.2.146
- Grainger, R. D., Levin, C., Allen-Byrd, L., Doctor R. M., & Lee, H. (1997). An empirical evaluation of eye movement desensitization and reprocessing (EMDR) with survivors of a natural disaster. *Journal of Traumatic Stress*, 10, 665–667. http://dx.doi.org/10.1002/jts. 2490100412
- Horowitz, M. J., Wilner, N. R., & Alvarez, W. (1979). Impact of event scale. A measure of subjective stress. *Psychosomatic Medicine*, *41*, 209–218.
- Ichii, M. (1997). Application of eye movement desensitization and reprocessing (EMDR) to survivors of the great Hanshin-Awaji earthquake: Treatment with less stress for stress disorder. *Journal of Biofeedback Research*, 24, 38–44. Retrieved from http://emdr.nku.edu/emdr\_ subject.php?subject=Natural%20Disasters
- Jarero, I., Artigas, L., & Hartung, J. (2006). EMDR Integrative Group Treatment Protocol: A post-disaster trauma intervention for children and adults. *Traumatology*, *12*, 121–129. http://dx.doi.org/10.1177/1534765606294561
- Jarero, I., Artigas, L., & Luber, M. (2011). The EMDR protocol for recent critical incidents: Application in a disaster mental health continuum of care context. *Journal of EMDR Practice and Research*, *5*, 82–94. http://dx.doi .org/10.1891/1933-3196.5.3.82
- Jayatunge, R. M. (2008). Combating tsunami disaster through EMDR. *Journal of EMDR Practice and Research*, *2*, 140–145. http://dx.doi.org/10.1891/1933-3196.2.2.140
- Jones, R. (1997). Child's reaction to traumatic events scale (CRTES). In Wilson, J., Keane, T. (Eds.), Assessing psychological trauma & PTSD. New York, NY: Guilford Press.
- Kar, N., & Bastia, B. K. (2006). Post-traumatic stress disorder, depression and generalised anxiety disorder in adolescents after a natural disaster: A study of comorbidity. *Clinical Practice and Epidemiology in Mental Health*, 2, 1–7. http://dx.doi.org/10.1186/1745-0179-2

- Katz, C. L., Pellegrino, L., Pandya, A., Ng, A., & DeLisi, L. E. (2002). Research on psychiatric outcomes and interventions subsequent to disasters: A review of the literature. *Psychiatry Research*, *110*, 201–217. http://dx.doi .org/10.1016/S0165-1781(02)00110-5
- Kendler, K. S., Karkowski, L. M., & Prescott, C. A. (1998). Stressful life events and major depression: Risk period, long-term contextual threat, and diagnostic specificity. *Journal of Nervous and Mental Disease*, 186, 661–669. http://dx.doi.org/10.1097/00005053-199811000-00001
- Kirmayer, L. J., Lemelson, R., & Barad, M. (2007). Understanding trauma. Integrating biological, clinical, and cultural perspectives. New York, NY: Cambridge University Press. Retrieved from http://books.google.co.uk/books? id=DXvpbu0tusMC&printsec=frontcover#v=one page&q&f=false
- Konuk, E., Knipe, J., Eke, I., Yuksek, H., Yurtsever, A., & Ostep, S. (2006). The effects of eye movement desensitization and reprocessing (EMDR) therapy on posttraumatic stress disorder in survivors of the 1999 Marmara, Turkey, earthquake. *International Journal of Stress Management*, *13*, 291–308. http://dx.doi.org/10.1037/1072-5245.13.3. 291
- La Greca, A. M., Silverman, W. K., & Wasserstein, S. B. (1998). Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *Journal of Consulting and Clinical Psychology*, 66, 883–892. http://dx.doi.org/10.1037//0022-006X.66.6. 883
- Lo, H. W. A., Su, C., & Chou, F. H. (2012). Disaster psychiatry in Taiwan: A comprehensive review. *Journal of Experimental and Clinical Medicine*, 4, 77–81. http://dx.doi .org/10.1016./j.jecm.2012.01.005
- Maxfield, L., & Hyer, L. (2002). The relationship between efficacy and methodology in studies investigating EMDR treatment of PTSD. *Journal of Clinical Psychology*, *58*, 23–41. http://dx.doi.org/10.1002/jclp.1127
- National Institute for Clinical Excellence. (2005). Posttraumatic stress disorder (PTSD): The management of PTSD in adults and children in primary and secondary care. London, United Kingdom: Author.
- Neria, Y., Nandi, A., & Galea, S. (2007). Post-traumatic stress disorder following disasters: A systematic review. *Psychological Medicine*, *38*, 467–480. http://dx.doi .org/10.1017/S0033291 707001353
- North, C. S. (2007). Epidemiology of disaster mental health. In R. J. Ursano, C. S. Fullerton, L. Weisaeth, & B. Raphael (Eds.), *Textbook of disaster psychiatry* (pp. 29–47). Cambridge, United Kingdom: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511544415
- North, C. S., Smith, E. M., & Spitznagel, E. L. (1994). Posttraumatic stress disorder in survivors of a mass shooting. *American Journal of Psychiatry*, 151, 82–88. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/8267140
- Norris, F. H., & Wind, L. H. (2009). The experience of disaster: Trauma, loss, adversities, and community ef-

fects. In Y. Neria, S. Galea, & F. H. Norris (Eds.), *Mental health and disasters* (pp. 29–45). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/ CBO9780511730030.003

- Pollice, R., Bianchini, V., Roncone, R., & Casacchia, M. (2011). Marked increase in substance use among young people after L'Aquila earthquake. *European Child* and Adolescent Psychiatry, 20, 429–430. http://dx.doi .org/10.1007/s00787-011-0192-2
- Pynoos, R. S., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., & Eth, S., et al. (1987). Life threat and posttraumatic stress in school-age children. *Archives of General Psychiatry*, 44, 1057–1063.
- Roos, R., Benjamin, A., de Roos, C., Meijer, A. M., & Stams, G. J. (2009). Efficacy of EMDR in children: A metaanalysis. *Clinical Psychology Review*, 2, 1–8. http://dx.doi .org/10.1016/j.cpr.2009.06.008
- Rubonis, A. V., & Bickman, L. (1991). Psychological impairment in the wake of disaster: The disaster-psychopathology relationship. *Psychological Bulletin*, *3*, 384–399. http://dx.doi.org/10.1037//0033-2909.109.3.384
- Seidler, G. H., & Wagner, F. E. (2006). Comparing the efficacy of EMDR and trauma-focused cognitive-behavioral therapy in the treatment of PTSD: A meta-analytic study. *Psychological Medicine*, *36*(11), 1515–1522. http://dx.doi.org/10.1017/S0033291706007963
- Shapiro, F. (1995). Eye Movement Desensitization and Reprocessing: Basic Principles, Protocols, and Procedures. New York: Guilford Press.
- Shapiro, F. (2001). Eye Movement Desensitization and Reprocessing, Basic Principles, Protocols and Procedures. (2nd ed.). New York: The Guilford Press.
- Shapiro, F., & Maxfield, L. (2002). Eye movement desensitization and reprocessing (EMDR): Information processing in the treatment of trauma. *Psychotherapy in Practice*, 58, 933–946. http://dx.doi.org/10.1002/jclp.10068

- Solomon, R. M., & Shapiro, F. (2008). EMDR and the adaptive information processing Model: Potential mechanisms of change. *Journal of EMDR Practice and Research*, 2, 315–325. http://dx.doi.org/10.1891/1933-3196.2.4.315
- Terranova, A. M., Boxer, P., & Morris, A. S. (2009). Factors influencing the course of posttraumatic stress following a natural disaster: Children's reactions to Hurricane Katrina. *Journal of Applied Developmental Psychology*, 30, 3440355. http://dx.doi.org/10.1016/j. appdev.2008.12.017
- Ursano, R. J., Fullerton, C. S., Weisaeth, L., & Raphael, B. (2007). Individual and community responses to disasters. In R. J. Ursano, C. S. Fullerton, L. Weisaeth, & B. Raphael (Eds.), *Textbook of disaster psychiatry* (pp. 3–26). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511544415
- Van Rood, Y. R., & de Roos, C. (2009). EMDR in the treatment of medically unexplained symptoms: A systematic review. *Journal of EMDR Practice and Research*, *3*, 248–263. http://dx.doi.org/10.1891/1933-3196.3.4.248
- Vernberg, E. M., La Greca, A. M., Silverman, W. K., & Prinstein, M. J. (1996). Prediction of post-traumatic stress symptoms in children after Hurricane Andrew. *Journal of Abnormal Psychology*, 105, 237–248.
- Watson, P. J. (2007). Early intervention for trauma-related problems following mass trauma. In R. J. Ursano, C. S. Fullerton, L. Weisaeth, & B. Raphael (Eds.), *Textbook of disaster psychiatry* (pp. 121–139). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511544415

Correspondence regarding this article should be directed to Fehmida Natha, Doctorate in Clinical Psychology, Lancaster University, Furness College, Faculty of Health and Medicine, Lancaster, LA1 4YG, United Kingdom. E-mail: f.patel@lancaster.ac.uk
# BOOK REVIEWS

### The Hidden Psychology of Pain: The Use of Understanding to Heal Chronic Pain

James Alexander. Balboa Press, Bloomington, IN, 2012, 470 pp., \$40.99 (paperback), \$7.11 (Kindle)

Alexander states the *problem* convincingly: Medical and pharmaceutical approaches to chronic pain (defined as lasting for more than three months) have failed. Prescription and illegal drug use is epidemic and frequently results in addictive and lethal side effects. Science and compassionately presented case studies defend the premise that chronic pain is perhaps *the* body–mind health condition. This timely introduction (Chapters 1 through 7) is recommended to all who experience chronic pain or illness—and to professionals who treat chronic pain victims.

The *solutions* pages (mostly pages 140 and beyond) may provide hope to open-minded clinicians seeking new ideas and to their chronic pain clients. Overall, recommendations for patients are sound: Be medically screened, distinguish between physical and psychogenic contributions, practice self-care (yoga, meditation), and consider how unresolved trauma may cause and maintain chronic pain.

References to specific interventions are more problematic; this section is less orderly, and opinion is sometimes offered as fact in spite of Alexander's claim that "everything in this book is supported by scientific evidence" (p. xv). The author, a clinical health psychologist, implies early on that the vast majority of chronic pain is reduced with accurate information; he also promotes "depth" psychotherapy. Comments about these interventions are consistent with the subtitle ("understanding" causes chronic pain relief) but neither is defended with science, and no specific depth therapies are endorsed. The book would be strengthened if this part were reduced and better clarified.

Alexander highlighted two innovative therapies as having special potential for healing chronic pain: emotional freedom techniques (EFT) and eye movement desensitization and reprocessing (EMDR). Paradoxically, neither of these requires understanding to produce benefit. Case testimonials and clear discussions of the potential of both EFT and EMDR make a good case for further investigation of their value and applicability with chronic pain sufferers. Experienced EFT and EMDR clinicians who treat pain sufferers will likely find the chapters generally credible and the case studies moving and familiar.

The science cited, however, is insufficiently convincing. Although controlled studies support both EFT and EMDR for trauma resolution, data are not available to justify Alexander's linking trauma and chronic pain. Hence, in a recent and comprehensive review of treatments for chronic pain (Jensen & Turk, 2014), neither EFT nor EMDR was mentioned. Well-narrated testimonials, left to speak for themselves, can be persuasive, even inspirational. Equating them with evidence can leave skeptics, especially academics, more skeptical.

The author correctly acknowledges "other factors" that contribute to chronic pain—in addition to unresolved trauma and related psychological causes. In this context, clinicians who work with pain victims may want to supplement the book with training in addictions (not covered), particularly when opiate-based pharmaceuticals and street drugs are involved. In addition, a team approach to treatment (also not covered) would be encouraged. EMDR clinicians may want to study manuals that specify those other factors, including a helpful EMDR approach pioneered by Mark Grant and an especially thorough EMDR protocol for migraine pain sufferers developed by Steven Marcus.

#### **REVIEWED BY JOHN HARTUNG**

#### Reference

Jensen, M. P., & Turk, D. C. (2014). Contributions of psychology to the understanding and treatment of people with chronic pain: Why it matters to ALL psychologists. *American Psychologist*, 69(2), 105–118.

## Healing the Folks Who Live Inside: How EMDR Can Heal Our Inner Gallery of Roles

Esly Regina Carvalho. Self-published, Brazilian Association of EMDR, Printed in the USA, 2013, 86 pp., \$12.00 (paperback)

Dr. Carvalho studied with Francine Shapiro in 1997 and was one of the first eye movement desensitization and

reprocessing (EMDR) trainer of trainers in Latin America. She has long been a trainer of psychodrama, perhaps the first psychotherapy to address ego states and dissociation. Dr. Carvalho skillfully combines the role theory of Jacob Moreno, a peer of Freud, and Carlos Raimundo's Play of Life with EMDR. She writes, "A role is a tangible way of being . . . According to Moreno, the self is born from the roles . . . we will spend our life integrating these roles that are constantly forming so that we can acquire a greater and greater sense of an integrated self' (p. 32). The Play of Life uses three mini-stages and Playmobil dolls to discover, understand, and modify aspects of people's relationships (p. 56). See www.playoflife.com.

This popularly written, brief book seeks to clarify the existence of "our inner gallery of roles" and to show how EMDR can heal the wounded roles or parts. She begins by describing the many aspects of roles and how our internal roles can hurt others. Roles also serve positive functions and are especially helpful when we learn to listen to them and to change their "address" from past to present. Dr. Carvalho powerfully describes the impact of trauma on our lives, and this section would be an excellent handout by itself for our clients.

Dr. Carvalho then explores Moreno's role theory. Our roles emerge in relation to those with whom we relate—parents, teachers, employers—the latter being called counter-roles. We also have psychodramatic roles in our imagination—such as our ideal mother. Having many roles facilitates our handling of many different situations in life. Those who are impoverished by having few role options do much more poorly. As we heal, we acquire new and more functional roles. Dr. Carvalho shares a striking description of a person's "emigration" from one role—a state of health—to that of another role—being ill with cancer. In the process, her reference points, friendships, and assumptions about life dramatically changed.

Engaging partial sessions of EMDR, Play of Life, and the use of both together highlight the treatment section of this book. The book closes with the summary of a moving EMDR session that successfully brought a young child role/part, an adolescent role/part, and a younger adult role/part fully into the safety of the present.

Dr. Carvalho writes simply and clearly and uses engaging metaphors and abundant quotes from her clients to illustrate her points. The translation is excellent. There are brief citations. The adaptive information processing model is mentioned and the standard EMDR protocol is used. I enjoyed this book and benefited from the integration of psychodrama and EMDR. Although it seems that this book is aimed at clients receiving role therapy who may now be getting EMDR, it speaks to a larger audience.

#### REVIEWED BY FARNSWORTH LOBENSTINE

## Unlocking the Emotional Brain: Eliminating Symptoms at Their Roots Using Memory Reconsolidation

Bruce Ecker, Robin Ticic, and Laurel Hulley. Routledge, New York, NY, 2012, 264 pp., \$36.95 (paperback)

If you are the kind of person who balks at textbooks, you might be inclined to bypass this one. That would be a pity because this dense but not overly long book holds a cache of information relevant to eye movement desensitization and reprocessing (EMDR) in particular and to the field of psychotherapy in general about what might make certain therapies work better than others.

Authors Ecker, Ticic, and Hulley describe a therapeutic/brain process called memory reconsolidation in which disturbing memories, feelings, thoughts, and somatization are eliminated. Drawing on current neuroscientific research and rigorous clinical observation, they explain how the brain acquires memories and how unwanted reactions become established through emotional learning. To effect the lasting healing of a symptom, the brain must unlearn this ingrained information and replace it with a different truth based on contradictory current evidence.

The authors have teased out the necessary steps in this process and identified their presence in several different therapeutic approaches. Among these are their own coherence therapy, Greenberg's emotionally focused therapy, Fosha's accelerated experiential dynamic psychotherapy (AEDP), Siegel's interpersonal neurobiology, and yes, you guessed it, Shapiro's EMDR. They recognize that each approach embodies specific factors but shares common factors, too. They hold that their findings are atheoretical and offer an abundance of clinical examples from these diverse approaches to illustrate the stepwise process, including a well-documented clinical case using EMDR.

Your curiosity may now be piqued as to what the steps of this transformational sequence in memory consolidation are. I will spill the beans, but you will have to read the book to learn the proper terms and application. I take the liberty of briefly summarizing their categories.

There are three phases that involve accessing the data, reactivating the memory, activating disconfirming evidence, and repetition of these two elements. The final phase is verification that symptoms have ceased.

Sound familiar? Yes, the steps they identify do indeed coincide with EMDR's phased treatment approach, sans bilateral stimulation.

They also describe in generous detail how they conduct coherence therapy, stressing that the therapist is not limited in terms of delivering the process creatively. In most approaches, it seems to me that the onus falls on the therapist to suss out the interpretive links between the emotionally learned symptoms (target memories) and the contradictory evidence (e.g., positive cognitions). Then the therapist must use clinical judgment to juxtapose the contradictory truths at the right time. With EMDR, although the protocol setup initially follows a more structured framework, the therapist's stance then becomes more passive while the client is unraveling their counteractive evidence toward the great ahah!

No matter which approach, the symptom resolves itself, often in a surprisingly speedy fashion, unlocking the emotional brain and destroying the existing synaptic connection. The new learning then forms a new synaptic connection. This transformational change occurs in an experiential, not cognitive, fashion. They specifically exclude cognitive therapy as efficacious for memory reconsolidation purposes because it forms a new neural pathway of learning but does not eliminate the old memory pathway, necessitating maintenance to prevent relapses.

They also take a balanced view on the role of attachment in emotional learning and the therapeutic process, highlighting the concept of neuroplasticity (the brain's ability to change).

On the downside, the publisher's formatting is crowded and how I longed for a cartoon for light relief because there is a lot of information packed into this book! What makes it more difficult to absorb is the introduction of a new vocabulary, which occupies a six-page glossary. These terms are mostly the language of coherence therapy. Chapters repeat the main precepts: helpful for some readers and annoying to others.

In all, the authors have made a significant contribution to the field by offering a model which integrates clinical techniques with neuroscientific findings, generously verifying a range of therapeutic approaches. This in itself offers a refreshingly needed atmosphere of cohesiveness and unity in the sometimes divisive world of psychotherapy.

#### **REVIEWED BY FRANCES KLAFF**

#### Handbook of Child Sexual Abuse: Identification, Assessment, and Treatment

Paris Goodyear-Brown. John Wiley & Sons, Inc., Hoboken, NJ, 2012, 612 pp., \$57.00 (hardcover)

Paris Goodyear- Brown has assembled a hefty primer on the topic of child sexual abuse (CSA). This worthwhile resource is not only beneficial for new or seasoned child therapists but also to those employed in foster care, child welfare, family law, and law enforcement.

The book details "best practices" for investigation and interventions of CSA. Ms. Goodyear- Brown divides the text into four parts: "Identification," "Assessment," "Evidence-Based Treatments and Other Effective Approaches," and "Special Issues." Each chapter within these sections is written by a leader(s) in the respective area of interest, thereby qualifying this book as a resource beyond compare.

Part 1 details the dynamics of CSA including prevalence, types of abuse, and risk factors. This section chronicles the impact of mass media, advances in identification of trauma, and the effect of CSA on brain development and health, thus provides a modern take on the dynamics of CSA.

Part 2, "Assessment," describes the role of multidisciplinary systems. Information about the use of case histories, assessments, and clinical/forensic interviewing are provided. In addition, this section establishes the value in use of evidence-based treatment and effective approaches for treatment of CSA.

These approaches are identified in the third segment with chapters written by experts on trauma-focused cognitive behavioral therapy, eye movement desensitization reprocessing (EMDR), trauma-focused integrated play therapy, parent–child interaction therapy, flexible–sequential play therapy, child–parent relationship therapy with nonoffending parents, trauma informed art therapy, group therapy and bibliotherapy. Each modality details a unique perspective for clinicians to explore.

The chapter on EMDR is written by Robbie Adler-Tapia, Carolyn Settle, and Francine Shapiro who define EMDR and cite research supporting it as an effective treatment for symptoms of CSA. The authors explain the Adaptive Information Processing theory, as well as the adaptability of this theory in conceptual collaboration with other modalities. Emphasis is placed on the significant advantage of EMDR as offering a methodology to access traumatic memories without relying on the creation of a trauma narrative. Furthermore, the authors outline factors which must be considered regarding the forensic interview when working with CSA. Highlighted by the authors is the ability of EMDR to address the traumatic symptoms of the client while simultaneously creating an unimpeded investigation. Three detailed case reviews that illustrate the eight phases of EMDR are also provided.

Part 3 of the book, "Special Issues," spotlights additional considerations of CSA. Specifically, topics such as problematic sexual behavior, self-injury, adolescent populations, cultural issues, secondary trauma and vicarious traumatization, and an ecological perspective toward preventing CSA are discussed.

In summary, Ms. Goodyear-Brown has provided an advantageous resource for all who work in the challenging arena of CSA. At times redundant, this book is best suited as a clinical resource rather than a cover-to-cover read. Although previous publications have addressed the special considerations of working with child victims of sexual abuse, Ms. Goodyear-Brown offers a cohesive manual of contemporary considerations when addressing the unique needs of this population.

#### **REVIEWED BY STACEY STEVENS**

# Defining and Redefining EMDR: New Clinical Strategies

David Grand. Self-published, EMDR Brasil, Brasilia, Brasil, 2013, 106 pp., \$15.00 (paperback)

David Grand addresses eye movement desensitization and reprocessing (EMDR) clinicians and begins with an upfront admission that he is presenting his personal style as a clinician. I am someone who likes being privy to the musings and decision points of an experienced therapist. But this book is too full of extraordinary unmet clinical promises. The back cover and the table of contents list new clinical strategies involving EMDR and the treatment of trauma, ego states, and character pathology. There are sections on diagnostics, critical incidents, body processing, and performance enhancement. And the book includes questions and answers on how to use EMDR with stuttering, self-use, and fear of flying among other areas. It includes two full verbatim EMDR sessions. This would be an incredible amount of material to be covered in 1,000 pages, let alone106 pages.

Dr. Grand's writing style is casual rather than professional, more akin to a blog than a professional publication. The book seems to have been hastily assembled without being edited or to have been converted to be sold on Amazon from a different format. There are numerous typographical errors and the table of contents inaccurately identifies page numbers as if the book were 148 pages rather than the 106 pages in the Amazon version.

My more serious concerns about the book relate to its clinical content. EMDR therapy has evolved over the years (F. Shapiro, 2001). There is a wide range of welldocumented, efficacious variations (Grant & Threlfo, 2002; Korn & Leeds, 2002; Luber, 2008; Popky, 2005; R. Shapiro, 2005, 2009; Jarero, Artigas & Luber, 2011). And EMDR practitioners give cautionary warnings about the care needed when treating complex cases such as dissociatively disordered clients (Twombly, 2005). Each of the innovative contributors has delineated a rationale or a theoretical or research base for deviating from the standard, but all stay within the parameters of EMDR therapy.

Dr. Grand presents a wide range of clinical techniques but fails to explicate a coherent or cohesive theoretical foundation for his clinical strategies. He does not appear to be coming from the accepted adaptive information processing (AIP) perspective. He often asserts that continual bilateral stimulation (BLS) is more effective than the standard use of BLS/dual attention stimulation (DAS). But he does not present clinical studies or a clear rationale to validate his stance. This reviewer questions whether Dr. Grand's variations are within the EMDR parameters as currently defined by EMDR International Association (EMDRIA). Perhaps he is opening a productive debate. However, Dr. Grand fails to make a strong case for redefining EMDR therapy in this book.

David Grand is a creative and experienced clinician and one of the pioneers of EMDR therapy. His work on

performance enhancement is particularly intriguing. He may be on the cusp of developing innovative and effective forms of psychotherapy. But he wraps his own personal style and clinical strategies in a cloak of EMDR and tries to reconfigure or redefine EMDR therapy to fit that style. Dr. Grand's clinical strategies as outlined in this book could mislead, distort, and set up false expectations for his readers, clinicians, and the general public alike by labeling and defining what he is doing as EMDR therapy and by oversimplifying complex clinical issues and interventions.

#### **REVIEWED BY NATALIE S. ROBINSON**

## References

- Grant, M., & Threlfo, C. (2002). EMDR in the treatment of chronic pain. *Journal of Clinical and Consulting Psychology*, *58*(12), 1–16.
- Korn, D. L., & Leeds, A. M. (2002). Preliminary evidence of efficacy for EMDR resource development and installation in the stabilization phase of treatment of complex posttraumatic stress disorder. *Journal of Clinical Psychology*, 58(12), 1465–1487.
- Luber, M. (Ed.). (2008). Scripted protocols: *Special populations*. New York, NY: Springer Publishing..
- Popky, A. J. (2005). DeTUR, an urge reduction protocol for addictions and dysfunctional behaviors. In R. Shapiro (Ed.), *EMDR solutions: Pathways to healing*. New York, NY: Norton.
- Shapiro, F. (2001). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures (2nd ed.). New York, NY: Guilford Press.
- Shapiro, R (Ed.). (2005). *EMDR solutions: Pathways to healing*. New York, NY: Norton.
- Shapiro, R. (Ed.). (2009). EMDR solutions II: For depression, eating disorders, performance, and more. New York, NY: Norton.
- Jarero, I., Artigas, L., & Luber, M. (2011). The EMDR protocol for recent critical incidents: Application in a disaster mental health continuum of care context. *Journal of EMDR Practice and Research*, 5(3), 82–94.
- Twombly, J. H. (2005). EMDR for clients with dissociative identity disorder, DDNOS, and ego states. In R. Shapiro (Ed.), *EMDR solutions: Pathways to healing* (pp.88–120). New York, NY: Norton.

## International Handbook of Workplace Trauma Support

Rick Hughes, Andrew Kindler, and Cary L. Cooper. Wiley-Blackwell, New York, NY, 2012, 516 pp., \$186.99 (hardcover) \$149.99 (e-book)

The International Handbook of Workplace Trauma Support is intended as a guide for anticipating, planning for, and responding to various trauma experiences that occur in the workplace. Of particular value is its emphasis on the impact that traumatic events have on the health of the organization, from employee suicides to large-scale disasters. The emphasis on planning and triaging events is particularly well-suited for a wide community of therapists who work in employee assistance programs (EAPs) to whom the book appears to be primarily targeted.

The book primarily draws from workplace examples which have been successfully used or which were valuable lessons learned primarily in the United States and the United Kingdom, although excellent chapters exist that describe the unique cultural contexts in other countries. The breadth of workplace settings and adaptive response models which were described were a major strength for the book. Another was the level of research detail that went into some of the chapters.

Perhaps the book's strength was its greatest challenge. Because organizational structures and regional services tend to vary a great deal by country, I found myself wondering at times who the professional might be that would find the scenarios applicable for her or his work. Furthermore, I was challenged that some of the research seemed dated, including the many references to the *DSM IV* instead of the more recent text revision.

Whereas various topics for planning and addressing workplace trauma were instructive, I found the flow a bit disjointed at times, with chapters not always reading cohesively. As is often the case when multiple authors contribute around a common topic, there was some degree of redundancy, such as the discussions of the history of employee assistance programs (EAPs). The book was nonetheless well-edited with a keen eye toward evidence bases in the assertions that were made with respect to the various theories and models which were described.

Information about eye movement desensitization and reprocessing (EMDR) is sprinkled throughout the book, including its use for treating mild dissociative symptoms and recommended applications in several of the models which were presented. Frequent citations throughout the book segue logically into Chapter 17, where the adaptive information processing (AIP) model and EMDR are given specific focus. This chapter, "Utilization of EMDR in the Treatment of Workplace Trauma" written by Roger Solomon and Isabel Fernandez, gives the theoretical basis for EMDR practice as well as full, step-by-step descriptions for the three-pronged and eight-phase protocols. Information is presented clearly and in straightforward fashion with the purpose of explaining EMDR to practitioners who may be unacquainted with the model. A case example is provided in which a police officer is taken through the eight phases. This brings the model to life and demonstrates its efficacy in treating one of the well-discussed workplace populations within the text. Chapter 17 was all together very strong in presenting both the AIP model and the EMDR protocols in a straightforward manner that clearly addressed the book's topic. It would have been of value perhaps to share information about EMDR International Association (EMDRIA) so that EAP therapists would have a ready reference should they elect to pursue EMDR certification.

This well-edited text presents a cohesive and easily understandable book. Authors have taken great care to explain contexts and situations, therapeutic applications, and protocols for the various methods of addressing trauma. I would highly recommend this book for any therapist who was involved or planning involvement with EAP work. It seems an indispensable guide for partnering with organizational leaders in mitigating the risk of traumatic impact on their respective work units.

#### REVIEWED BY STACEE REICHERZER

## The Rite of Return: Coming Back From Duty-Induced PTSD

Karen Lansing. Self-published, High Ground Press, Monterey Bay, CA, 2012, 198 pp., \$15.50 (paperback)

Rite of Return: Coming Back From Duty-Induced PTSD is designed to assist first responders who need information regarding the development of acute stress and posttraumatic stress disorder (PTSD) and how to come back from the psychological injury. It provides practical guidance to this population on effective treatment options. The publication serves to educate mental health professionals with valuable information regarding the culture of warriors (law enforcement and military) and rescuers (firefighters, paramedics, lifeguards, ski patrols, and mountain search and rescue). The design of the book's chapters and the use of terminology serve to maintain a real-world authenticity in working with responders and provides a glimpse into what it is like to be a mental health professional working with them. A glossary of the terms is provided for the reader as a means of insuring everyone is on board with understanding the message of the book.

The author, an eye movement desensitization and reprocessing (EMDR) therapist, introduces the reader to the impact of PTSD among those persons who serve our nation and communities as they run toward danger during challenging times. Eight case studies are presented describing the various intense experiences from which responders developed PTSD. Readers are introduced to the efficacy of EMDR therapy in the treatment of duty-induced PTSD. The efficacy of EMDR is substantiated with full-color single-photon emission computed tomography (SPECT) imaging made at pre- and posttreatment of the responders. Of particular interest is the demonstrated change in areas of the brain such as the cingulate gyrus, the basal ganglia, the amygdala, and the cerebellum illustrated with the SPECT studies before, during, and after treatment. The evidence presented in this book offers hope to those who struggle with the disorder.

Persons who wish to understand more about the culture of first responders, their needs, and how this author has served them will benefit from reading this book. Warriors and rescuers who desire more information about duty-induced PTSD and effective treatment options will also value this book and read it intently (as will their spouses).

A strength of the book is its design for providing information to first responders and many military personnel. This book is exceptional in accomplishing this goal. An additional strength is the author's rich depth of experience in working with this population. It provides military personnel and first responders with an important understanding of stress disorders and PTSD along with options for treatment. Limitations of the book include the fact that mental health professionals will find much of the material on PTSD is familiar, even redundant. There are no new contributions toward the discussion of PTSD. However, what is added are SPECT images which demonstrate the effectiveness of EMDR therapy in the treatment of PTSD. This book makes a valuable contribution in understanding the first responder population, the impact of duty-induced PTSD, and the value of EMDR therapy as an effective treatment.

REVIEWED BY E. C. HURLEY

## Programs and Interventions for Maltreated Children and Families at Risk: Clinician's Guide to Evidence-Based Practice

Allen Rubin. John Wiley & Sons, Hoboken, NJ, 2012, 384 pp., \$58.00 (paperback)

Several years ago, noted educators Allen Rubin and David Springer set out to create a clinical series designed to keep practicing clinicians abreast of evidence-based practices. Their goal was to provide brief foundational reviews of various interventions while focusing on a "how-to" approach—enabling clinicians to immediately integrate these treatments into their clinical work.

This book is the latest installment in this series. It focuses on prevention as well as treatment, with highly specialized topics addressed. The text is divided into sections concentrating on different types of programs and treatments for high-risk children and families, including those involved with child protective services, intimate partner violence, substance abuse, and high-risk parenting practices. The section on trauma-focused interventions contains two chapters: one on trauma-focused cognitive behavioral therapy for children and one on eye movement desensitization and reprocessing (EMDR) for abused and neglected children.

The EMDR chapter, "EMDR for the Treatment of Children in the Child Welfare System Who Have Been Traumatized by Abuse and Neglect," is written by noted author and clinician Robbie Adler-Tapia, who is widely published on EMDR practices in children and adolescents. She offers a step-by-step guide for practitioners, including the basic underpinnings of both EMDR and its adaptive information processing theory as well as explaining how to adapt interventions to meet the needs of younger clients. Integrating developmental and attachment theory, Dr. Adler-Tapia offers a customized EMDR protocol by breaking down each of the eight phases of treatment into easy-to-follow steps for clinicians. It is noted that despite the inherent challenges when clients' cognitions are not fully developed, there is also a unique opportunity associated with such interventions. Dr. Adler-Tapia asserts that a key benefit to using EMDR with children is that "neurodevelopment is most rapid and malleable and treatment can have its greatest impact" (p. 142). In addition to the adapted protocol, readers are provided with an overview of considerations for the impact of child welfare involvement as well as important considerations in case conceptualization and treatment planning with this unique population. Although the chapter does not provide an illustrative case example, it does offer specific suggestions aligned with each stage of the therapeutic process. Dr. Adler-Tapia also provides the reader with references to comprehensive EMDR literature reviews.

Dr. Rubin's Programs and Interventions for Maltreated Children and Families at Risk: Clinician's Guide to Evidence-Based Practice is a selective collection of best practices for clinicians working with children and families. The chapters are authored by clinical practitioners well-known for their expertise in each of the distinctive empirically supported interventions covered in the text. In addition, Dr. Rubin provides a chapter-by-chapter summary of the empirical support for each of the interventions addressed as well as a review of the empirical support process. The latter is particularly helpful to practitioners who wish to better understand the process of clinical research as well as those who might feel motivated to contribute to the literature themselves. Content is presented in clear, easy-to-understand terms, with substantial support provided through references and suggested readings. Although targeted for therapists working with at-risk populations, practitioners in various settings will find this text to be a helpful clinical reference guide.

#### **REVIEWED BY STEPHANIE K. SCOTT**

# Journal of EMDR Practice and Research

## INSTRUCTIONS FOR AUTHORS

The *Journal of EMDR Practice and Research* is a quarterly, peer-reviewed publication devoted to integrative, state-of-the-art papers about Eye Movement Desensitization and Reprocessing. It is a broadly conceived interdisciplinary journal that stimulates and communicates research and theory about EMDR, and their application to clinical practice. The journal publishes theoretical, review, and methodological articles; case and field studies; brief reports; and book reviews. The journal also contains a clinical section, which is designed to foster clinicians' understanding and skills. It includes brief clinical vignettes and a column to respond to therapists' questions.

## **Manuscript Submission**

Submit manuscripts, in English, in MS Word format by e-mail to the Editor, Dr. Louise Maxfield at maxfield@rogers.com. Manuscripts will be acknowledged on receipt. Following preliminary review by the Editors, to ensure compliance with required elements, manuscripts will be peer-reviewed.

## **Manuscript Style**

The following are guidelines for developing and submitting a manuscript. Manuscripts that do not conform to these guidelines will be returned to the author without review, and with recommendations for changes needed to complete the submission process.

- 1. Manuscripts must be professionally prepared in accordance with the *Publication Manual of the American Psychological Association,* 6th edition, 2010.
- 2. Manuscripts are generally expected to be about 25 pages in length and double-spaced throughout.
- 3. The title page must include authors' names, positions, titles, affiliations, full contact information (address, phone, fax, and e-mail). This information should not be included elsewhere in the manuscript, to ensure blind review.
- 4. The second page should contain the title of the paper, an abstract of no more than 200 words, and 4 to 6 key words listed below the abstract. Key words should express the precise content of the manuscript, as they are used for indexing purposes.
- 5. All articles must contain a comprehensive literature review. For example, a manuscript describing EMDR treatment of a certain disorder would summarize the literature about the nature of that disorder, review research studies that investigated outcomes of other treatments, as well as studies that evaluated EMDR treatment of that disorder.
- 6. Articles that recommend a clinical approach that differs from Shapiro's (2001) Adaptive Information Processing model should discuss these differences.
- 7. Non-research papers that recommend significant changes to EMDR standard procedures must provide empirical support for that modification.
- 8. In order to promote critical thinking and an unbiased approach for the dissemination of ideas, recent advances, and current research, all articles must take an objective, scientific stance.
- 9. Photos and line art figures should be sent as tiff or jpg (300 ppi) or eps files.
- 10. Contributors are responsible for obtaining written permission from copyright owners for illustrations, adaptations, or quotes of more than 300 words.