

# **Eye Movement Desensitization and Reprocessing: An Analysis of a Controversial Evidence Based Treatment**

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## **Introduction**

Eye movement desensitization and reprocessing (EMDR) is an inventive, popular and highly controversial treatment. Within the scientific and professional community, there is divergent support for each side of this debate. The heart of this controversy critically examines the question of whether EMDR is as efficacious as other well-established interventions for the treatment of PTSD. The efficacy of EMDR could be due to its employment of a variety of clinically sound therapeutic procedures, such as those similar or the same as Prolonged Exposure Therapy, and not because of its centerpiece eye-movements. Indeed, some researchers have argued that the eye-movements are completely unnecessary

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and that EMDR is best understood as an exposure technique (Renfrey & Spates, 1994; Davidson & Parker, 2001; Lohr, Lilienfeld, Tolin & Herbert, 1999). EMDR may be an effective treatment for non-combat related PTSD but is not effective for PTSD etiologically related to combat induced trauma. Thus there are three questions that serve as the focus of this evaluation: is EMDR qualitatively different than Prolonged Exposure Therapy; are the eye-movements necessary for treatment efficacy; and is EMDR effective for combat-related PTSD?

### Overview

EMDR was introduced by Francine Shapiro in 1989 as a treatment for post traumatic stress disorder (PTSD), EMDR has also been shown effective in a variety of anxiety disorders, including the treatment of traumatic memories, panic disorder, claustrophobia, blood and injection phobias, and spider phobia (Davidson & Parker, 2001). Additionally, it has been proven effective in the treatment of test anxiety (Bauman & Melnyk, 1994; Gosselin & Matthews, 1995) and has been used with limited effectiveness in treating public-speaking anxiety (Foley & Spates, 1995).

In 1998, independent reviewers working under the auspices of the American Psychological Association's (APA) Division 12 Task Force on Psychological Interventions recognized EMDR as a "probably efficacious treatment" for civilian PTSD (Chambless et al., 1998). Chambless et al. cited only two other treatments as probably efficacious for PTSD, Exposure Therapy and Stress Inoculation Training (Perkins & Rouanzoin, 2002).

Additionally, Chemtob, Tolin, van der Kilk and Pitman (2000) reported that EMDR was designated an "effective" treatment, receiving an A/B rating from the Treatment Guidelines Committee of the International Society for Traumatic Stress

Studies (ISTSS), an organization charged with evaluating treatments for PTSD. Despite this, the question of whether EMDR is simply a variation of Prolonged Exposure Therapy, combined with eye movements operating as a placebo, is a hotly debated topic.

Currently EMDR is practiced primarily as a treatment for trauma and anxiety reduction. Additionally, Shapiro notes that though desensitization to anxiety is suggested by the name, it is equally important to note that therapeutic goals include the elicitation of positive affects, evoked insights, belief alterations and behavioral shifts (2002). Thus, behavior modification (reprocessing) is an important aspect of EMDR. EMDR is hypothesized to facilitate reprocessing by allowing the patient to access maladaptive information, process traumatic memories, and to bring these to an adaptive resolution, indicated by desensitization of emotional distress, reformulation of associated cognitions, and relief of accompanying physiological arousal (Maxfield & Hyer, 2002). It is a complex treatment that incorporates many different interventions, including imaginal exposure (under conditions of divided attention), free association and other techniques (Taylor, Thordarson, Fedoroff, Maxfield, Lovell & Ogrodniczuk, 2003). The main intervention utilizes some form of external oscillatory stimulation, usually in the form of eye-movements, while requiring the patient to recall trauma-related memories. Eye movements have been reliably associated with higher cognitive processes and cortical function, and with shifts in cognitive content (Shapiro, 2002).

However, other forms of stimulation can be used. Shapiro (2002) states "although EMDR is widely known, the name has in many ways served to confuse. In fact, the eye movement is only one form of dual stimulation used, along with hand taps and tones." Thus during EMDR, the client focuses on emotionally disturbing material while simultaneously attending to an external stimulus

provided by the therapist which can be in the form of eye movements across the midline, hand taps or audio tones.

Armstrong and Vaughan (1996) provide rationale for why forms of stimulation other than eye-movements can be successful in therapy. First, the individual's arousal system is 'primed to respond' by instructing the client to concentrate on the traumatic event, including memories of the image, physiological sensations and emotional significance. Subsequently, by attending to the waving hand of the therapist (or hand-taps, etc.), combined with the active trauma elements, an intense orienting reaction to the present status is elicited. In so doing, as the client in the therapeutic situation can identify no immediate threat, the danger response rapidly extinguishes.

A number of studies have reported that EMDR is an effective treatment for PTSD (Barrowcliff, Gray, MacCulloch, Freeman & MacCulloch, 2003; Silver & Rogers, 2005; Ironson, Freund, Strauss & Williams, 2002; Carlson, Chemtob, Tusnak, Hedlund & Muraoka, 1998; Hyer & Brandsma, 1997; Maxwell, 2003; Grainger, Levin, Allen-Byrd, Doctor & Lee, 1997; Chambless et al., 1998; Vaughan, Armstrong, Gold, O'Connor, Jenneke, & Tarrier, 1994; Montgomery & Ayllon, 1994; Forbes, Creamer & Rycroft, 1994).

While these studies provide evidence that EMDR leads to a reduction of PTSD symptoms in certain populations, there remains controversy regarding its efficacy compared to other cognitive-behavioral treatments. For example, Taylor, Thordarson, Fedoroff, Maxfield, Lovell and Ogradniczuk (2003) compared Exposure Therapy, EMDR and Relaxation Therapy for the treatment of PTSD and found though all three treatments were associated with a reduction in PTSD symptomology, only Exposure Therapy reduced avoidance. Additionally, using a meta-analysis of 34 studies that examined EMDR, Davidson and

Parker (2001) found that EMDR showed an effect when compared with no treatment and with therapies not using exposure to anxiety-provoking stimuli. However, in pre-post EMDR comparisons they found no significant effect when EMDR was compared with other exposure techniques.

EMDR may be another victim of the oft-cited "Dodo Bird verdict" that all treatments are equally effective (Beutler, 2002; Luborsky et al., 2002; Wampold et al., 1997) and that the eye-movements of EMDR are a placebo. Lohr, Lilienfeld, Tolin and Herbert (1999) reviewed the literature to critically examine whether EMDR possessed efficacy above and beyond nonspecific treatment effects and components that are shared with well-established interventions and found that the effects of EMDR are largely limited to verbal report indices; eye-movements and other movements appear to be unnecessary; and the reported effects of EMDR are consistent with nonspecific treatment features. As can be seen, the jury is still out on a definitive approval of efficacy for EMDR.

Several studies have provided support for the effectiveness of EMDR to treat mass trauma situations. For example, Grainger, Levin, Allen-Byrd, Doctor and Lee (1997) used EMDR with survivors of Hurricane Andrew. Their study showed positive results in that there was significant improvement over wait list controls in perceived posttraumatic avoidance behaviors and thoughts as measured by changes in the Impact of Event Scale and significant improvement in subjective aversive reactions to representative experiences of the hurricane (Grainger et al., 1997). These results are bolstered by their acknowledged difficulty of conducting field research in a disaster setting as they comment on being beleaguered by "confusion, disorganization and chaos". Random selection was difficult and data was often missing when people relocated (Grainger et al, 1997).

Following the September 11, 2001 attacks on the World Trade Center, Silver, Rogers, Knipe and Colelli (2005) provided psychological relief using EMDR. They used this opportunity to evaluate the effectiveness of EMDR on PTSD as used in a community-based volunteer effort. Silver et al. used EMDR trained clinicians on a total of 65 individuals. They found that on average, clients reported statistically and clinically significant positive change on all outcome measures. The major finding of the study was a 50%-61% decrease in average scores of the standardized measures of anxiety, depression and PTSD symptoms and an even greater improvement in self-report measures in an average 4-5 treatment sessions.

Two groups of clients were identified from the subject pool in order to provide insight into issues associated with time of intervention. The early group consisted of clients seen in the first 2 to 10 weeks after 9/11 and the late group consisted of clients seen 30 to 48 weeks after 9/11. The late group demonstrated a statistically significant higher level of disturbance as measured by the SUD than the early group. Yet, both groups averaged the same number of sessions before recovery and results suggest that EMDR was equally effective for clients regardless of the duration of their disturbances. Thus, EMDR seems effective as both an early and late intervention to mass trauma.

There are two major drawbacks identified by the researchers, which question the validity of their results. First, their study lacked a control group, thus it is impossible to tell whether or not the observed effects were due to therapy, to the passage time or even to non-specific effects of treatment. Accordingly, the possibility of clinical attention alone could be responsible for the improvement. The other limitation of this study concerns the lack of diagnostic measures. It is not known how many of the clients met diagnostic criteria for PTSD and other conditions. Thus these results can only be weakly generalized to PTSD

research.

### **Current Controversy**

Six studies focus upon three points of the controversy surrounding EMDR. First, is EMDR an effective therapy for the treatment of PTSD above and beyond that of Prolonged Exposure Therapy? Secondly, are the eye-movements inherent in EMDR necessary for recovery? Finally, can EMDR be used to treat all forms of PTSD, or does it fail with populations of combat-induced trauma?

#### EMDR vs. Prolonged Exposure Therapy

Two studies have demonstrated that EMDR and exposure therapy are clinically distinct therapies, highlighting controversial elements surrounding this distinction. There are many ways in which superiority can be measured: which treatment is more effective, which is efficiently superior, which treatment works quicker or with fewer sessions, and which treatment shows improvement based on which scales, inventories or tests.

Taylor, Thordarson, Fedoroff, Maxfield, Lovell and Ogradniczuk (2003) examined three interventions for this disorder, Exposure Therapy, EMDR, and Relaxation Training, in an effort to determine the differences in efficacy, speed and incidence of symptom worsening between the three. Their sample was composed of 45 participants who all met DSM-IV diagnostic criteria for chronic PTSD. They were randomized to eight 90-minute individual sessions of either exposure therapy, EMDR, or relaxation training. Sessions were audiotaped to assess interrater reliability and videotaped for treatment integrity ratings. Participants completed an evaluation consisting of the SCID-IV, CAPS, and self-report questionnaires. At the beginning of each treatment session, participants completed the PTSD Symptom Severity Scale to assess symptoms over the past week. Once a month after

treatment ended, participants were reinterviewed with the CAPS and completed the self-report outcome measures. Finally, three months later, a follow-up assessment was administered consisting of the CAPS and self-report measures (Taylor et al., 2003).

The results show that each treatment was successful in diminishing symptomology corresponding to the four dimensions of PTSD. CAPS scores declined from pretreatment to follow-up in each treatment condition for each of the four dimensions and each treatment condition. These reductions were statistically significant. Exposure therapy was significantly more effective than both relaxation training and EMDR for reexperiencing and avoidance, whereas EMDR and relaxation training did not differ. There was a general trend for exposure therapy to have the highest percentage of participants with clinically significant change. Regarding this trend, reexperiencing, avoidance and hyperarousal were found to be statistically significant. Again, EMDR and Relaxation Training did not differ. Additionally, there was a trend for exposure therapy to be more effective in terms of speed of recovery over EMDR, however this was not clinically significant (Taylor et al., 2003).

The superior efficacy of Exposure therapy for the treatment of PTSD suggests that EMDR and Exposure therapy are categorically distinct and that EMDR is the less effective intervention of the two. Because the major difference between Exposure and EMDR is the addition of eye-movements, it can be generalized that in this study the eye-movements of EMDR actually hindered its efficacy. These results are reinforced by Taylor et al.'s adherence to Foa and Meadow's (1997) gold standards for methodologically sound treatment outcome research. Moreover, it is the first study of EMDR for PTSD that does so (Taylor et al., 2003).

Ironson, Freund, Strauss and Williams (2002) also compared EMDR with Prolonged Exposure, finding different results.



Specifically, they analyzed symptom reduction in depression, maintenance of treatment gains, and the relative tolerability of these approaches (i.e., dropout rates and evoked distress). Ironson et al. hypothesized that both treatments would be similarly effective and that Prolonged Exposure would experience a higher dropout rate while EMDR would be associated with less distress. Their reason being "in contrast to flooding techniques used in exposure, EMDR requires only a small amount of the patient's attention to be directed at the most unpleasant part of the traumatic memory, with no deliberate exacerbation of distress by concentrating on the details of the traumatic experience" (Ironson et al., 2002).

They found a significant reduction in PTSD scores for both Prolonged Exposure and EMDR. ANOVA tests were nonsignificant indicating that neither treatment was significantly more effective than the other in reducing the symptoms of PTSD. However, it should be noted that with Prolonged Exposure, only four of the 12 participants met the criterion for sufficient improvement for treatment termination. This criterion was set at a 70% reduction in PTSD symptoms over six sessions. EMDR had 9 of 10 participants meet the criteria, indicating that EMDR was a less stressful and more palatable treatment. Additionally, six of the 12 participants assigned to the PE condition dropped out while only one of 12 dropped out with EMDR. Along this line of reasoning, it is also interesting to note that SUDS scores decreased more during the initial EMDR session than for Prolonged Exposure and that at postsession scores on SUDS were significantly higher for the PE group. Thus, this study lends support for a distinction between Exposure and EMDR. However, in contrast to Taylor et al.'s (2003) findings, Ironson et al. (2002) found EMDR to be the more effective treatment.

### Eye Movements

Numerous studies prove that EMDR is effective in the treatment

of PTSD, but few theoretical explanations of how EMDR might work have been offered. Shapiro proposed that the saccadic eye-movements used in EMDR are linked to alterations in information processing perceived within the mind, specifically that they mimic the saccades of rapid eye movement sleep (REM) (Stickgold, 2002), yet neither she, nor others, has provided evidence to explain or support her theory. Indeed there is no biological evidence in support of EMDR aside from assurances of its effectiveness by EMDR practitioners. (It should be noted that while there is existing evidence that demonstrates it is effective, there is not evidence demonstrating how or why it is effective.) This may explain why the controversy surrounding these eye movements is so fervent.

Stickgold (2002) proposed a cognitive neuroscientific model for eye movements that is compatible with Shapiro's hypothesis. It is based on biological evidence that PTSD is a consequence of failed memory processing and consolidation during REM sleep. Therefore EMDR's eye movements may induce a REM-like state, thereby facilitating the integration of traumatic memories. Stickgold notes that automatic shifts in attention, followed by a startle response, produce a release of epinephrine and norepinephrine in order to generate attendance to the startle stimulus and the classic fight or flight response. Moreover, during the startle response, the brainstem initiates pontogeniculooccipital (PGO) waves. These brain waves have also been found to control the REM/non-REM cycle (Stickgold, 2002).

Stickgold surmises that having a person repetitively reorient her attention from one location to another could produce shifts in regional brain activation similar to those produced during REM sleep, which would facilitate memory integration. He goes on to point out that EMDR is more effective at resolving trauma caused by a lapse in memory integration to the cortex, whereas REM is not, because EMDR is done while the client is awake and frontal

lobe activity is uninhibited. Accordingly, the patient can choose the material to hold in mind at the start of the bilateral stimulation. Thus any associations that arise will most likely be related to this original image, and the therapist can moderate the management of fear and anxiety (Stickgold, 2002).

Stickgold's model accounts for why eye movements may be effective. In support of the argument, Barrowcliff, Gray, MacCulloch, Freeman and MacCulloch (2003) demonstrated effectiveness of eye movements by measuring electrodermal response to an orienting stimulus. In this study, they used an auditory stimulus instead of eye movements to control for habituation effects following a repeated presentation. Shapiro (2002) and others (Foley & Spates, 1995; Bauman & Melnyk, 1994) have endorsed both audio tones and hand taps as effective substitutes for eye movements. There is no evidence, however, to support the conclusion that audio tones or hand taps utilize Stickgold's model (2002), mimic REM sleep or help the integration of traumatic memories.

To demonstrate evidence that eye movements are integral to EMDR, Montgomery and Ayllon (1994) compared EMDR with a saccade phase to a non-saccade phase. The study used a sample of six adults who met the diagnostic criteria for PTSD. The subjects were asked to generate a series of voluntary, bilateral, rhythmic saccadic eye movements by moving a stimulus (an upraised index finger) rapidly back and forth across their field of vision (Montgomery & Allyon, 1994).

The results demonstrate that during baseline, subjects held a stable level of subjective distress as measured by SUDs. After treatment, statistical difference between baseline and non-saccade condition for the presence of intrusive thoughts was not found. However, based on self-report data, all subjects reported relief from PTSD symptoms in the saccadic eye-movement condition.

Montgomery and Allyon (1994) also note that the data indicates that with PTSD subjects the use of short duration repeated exposure and cognitive restructuring alone were insufficient for positive treatment gain. Whereas, the addition of the saccadic eye movements to the treatment package resulted in the significant decreases in self-reports of distress previously addressed.

However, there are limitations to this study. First, the results of this study are based largely on patient self-report, which is known to be an unreliable measure. Montgomery and Allyon note that though all self-report measures demonstrated both clinically and statistically significant treatment gains, all the psycho-physiological measures of treatment failed to demonstrate statistical significance. For example, measures of systolic blood pressure and heart rate recorded across all phases of the study did not achieve statistical significance. Second, based on Rosen's (1995) description of saccadic eye movement, it does not appear that the eye movements in the study were truly saccadic. However, in order to be in line with Stickgold's (2002) theory, a saccade is truly necessary in order to mimic REM sleep and thus consolidate traumatic memories. The act of following a therapist's finger as it traverses through each field of vision most likely induces smooth-pursuit eye movements, which would not induce memory integration in hippocampal and other medial temporal brain areas.

Renfrey and Spates (1994) have provided evidence contrary to Montgomery and Allyon (1994), which would suggest that eye movements are unnecessary for the treatment of PTSD. In their sample, 23 individuals, who met diagnostic criteria for PTSD as specified by the DSM-III-R, were used.

The results indicate that all three treatment conditions resulted in a decrease in symptoms, a finding not uncommon in other studies as well. No significant differences were found between the

treatment effects of any of the three interventions. However, it was noted during follow up sessions that the symptom reduction had remained stagnant since posttreatment. Also, between groups there were no significant differences for physiological measures such as heart rate.

Based on these results, it was concluded by Renfrey and Spates (1994) that eye movements are not an essential component of the intervention and instead the benefits of this therapy are due to non-specific treatment effects that EMDR has in common with other similar treatments. It should be noted that Renfrey and Spates used a small number of subjects, which could show the lack of robustness in their findings.

#### EMDR and Combat PTSD

The question of whether EMDR is effective within this population exhibiting PTSD is yet unresolved. It should be commented on that the APA's Division 12 Task force gave their rating of "probably efficacious treatment" for civilian PTSD (Chambless et al., 1998). As previously mentioned, they found no "well established treatments" for either civilian or combat-related PTSD. They make no mention of combat related PTSD. Perkins and Rouanzoin (2002) write that in addition to studies reviewed by Chambless et al. (1998), other well-designed outcome studies have supported the efficacy of EMDR with civilian PTSD and combat-related PTSD. According to the EMDR Institute website (<http://www.emdr.com/efficacy.htm>) "The Department of Defense/Department of Veterans Affairs Practice Guidelines have placed EMDR in the highest category, recommended for all trauma populations at all times."

As can be seen, research has yet to provide clear evidence to indicate if EMDR is effective with combat veterans with PTSD. Indeed it seems that a consensus on this muddled issue is hard to find. In order to accomplish just that, Jenson sought to test, under

controlled experimental conditions, the efficacy of EMDR with Vietnam combat veterans with a diagnosis of PTSD. The majority of attention and research in the population of combat-related trauma has been directed toward Vietnam combat veterans (Jensen, 1994). Therefore, his sample included 25 male Vietnam combat veterans who met criteria for PTSD as documented by the Structured Interview for PTSD (SI-PTSD). EMDR treatment consisted of one history-taking session and two treatment sessions, with both history-taking and treatment following structured guidelines based on Shapiro's treatment manual.

Results showed EMDR to be ineffective for the treatment of combat-related PTSD. The only posttest in which the EMDR group benefited over the control group was with the SUD-posttest, indicating that subjects experienced reduced in-session anxiety upon exposure to traumatic cues in comparison with the control. On all other posttests the mean of the EMDR group did not differ significantly from the mean of the control group.

These findings contradict the Department of Defense/Department of Veterans Affairs Practice Guidelines in that it appears that EMDR is not effective for combat-related PTSD. However, this study suffers from a variety of methodological problems, which could be indicative of its failure to treat combat veterans. For example, subjects in the control condition were told they were not receiving treatment, which could have led to the subjects to adopt discrepant opinions regarding the alleviation of their symptoms and poor outcomes on posttest measures. Additionally, this study used a small sample size, which is usually indicative of insufficient power to demonstrate a full effect.

In contrast to Jensen's (1994) results, Carlson, Chemtob, Rusnak, Hedlund and Muraoka (1998) compared PTSD with biofeedback-assisted relaxation and a control in the treatment of combat-related PTSD and found significant treatment effects for

EMDR. Additionally they averted many of the drawbacks that were found with Jenson's (1994) study. They used 35 male veterans who met diagnostic criteria for PTSD.

Participants were assigned to one of three conditions, treatment with EMDR, treatment with relaxation training and a control where the client was treated with routine therapy. Clients were assessed in five phases, pretreatment, treatment, posttreatment, a 3-month follow-up and then a 9-month blind follow-up. The results show that at pretreatment, all subjects demonstrated very high anxiety levels and no consistent differences between subjects' physiological levels. However, at posttreatment and/or three-month follow-up, the combat veterans with PTSD who received EMDR treatment improved significantly more than veterans in routine clinical care or in biofeedback-assisted relaxation as well as for anxiety and depression (Carlson et al., 1998). Moreover, the treatment effect sizes were generally large, which indicated their robustness, and were maintained at the blind 9-month follow-up session. This study provides evidence that combat-related PTSD can be treated using EMDR.

It should be noted that with this study, while both EMDR and Relaxation Therapy followed a trend of general therapeutic value, no physiological measures were statistically significant from one another for either therapy. The authors point out that there is no existing controlled documentation that exposure (or other) therapies impact on physiological arousal that may characterize PTSD, despite evidence for cognitive/behavioral effects due to exposure treatment (Carlson et al., 1998). This theory is plausible, however a lack of evidence should never be confused with evidence, which does not support one's hypothesis, and the lack of physiological arousal in the subjects of this study could be due to a poor treatment technique.

### **Conclusion**

EMDR remains a controversial issue. The research cannot agree as to whether or not EMDR is a distinct treatment from prolonged exposure therapy. Such a distinction would bolster EMDR's legitimacy as "gold standard" treatment for trauma victims. While there is a growing body of literature that suggests that EMDR is a categorically distinct treatment (Barrowcliff, Gray, MacCulloch, Freeman & MacCulloch, 2003; Shapiro, 2002; Gosselin & Matthews, 1995; Bauman & Melnyk, 1994; Foley & Spates, 1995; Perkins & Rouanzoin, 2002; Montgomery & Ayllon, 1994; Carlson, Chemtob, Rusnak, Hedlund & Muraoka, 1998; Silver, Rogers, Knipe & Colelli, 2005). Others claim it is indistinct from similar flooding techniques (Rosen, 1995; Davidson & Parker, 2001; Lohr, Liliensfeld, Tolin & Herbert, 1999; Jensen, 1994; Taylor, Thordarson, Federoff, Maxfield, Lovell & Ogrodniczuk, 2003). In addition, due to a number of methodological flaws it remains difficult to determine if EMDR is more effective than other cognitive-behavioral treatments for PTSD. Future studies using more rigorous designs will likely provide important insights into this question.

Another important aspect of the controversy concerns whether or not the eye movements, which form the centerpiece of EMDR, are necessary and effective for the treatment of PTSD. On one hand, a large body of evidence suggests that the eye movements are effective (Shapiro, 2002; Barrowcliff, Gray, MacCulloch, Freeman & MacCulloch, 2003; Gosselin & Matthews, 1995; Bauman & Melnyk, 1994; Silver, Rogers, Knipe & Colelli, 2005; Grainger, Levin, Allen-Byrd, Doctor & Lee, 1997). Yet these studies often suffer from small sample sizes, a lack of a control group, poor methodology and other shortcomings. However, critics of eye movement, who are on the other end of the spectrum, are equally undecided. Rigorously controlled studies, which could offer evidence that eye movements are unnecessary



to EMDR, are lacking. A comprehensive review of the literature shows a large body of literature reviews and meta-analyses, which claim that eye movements are unnecessary, but careful examination of their references shows that they cite each other and not primary sources. Indeed this author could only find one primary source, containing a modicum of experimental rigor, against the eye-movements.

Stickgold's (2002) theory that inducing saccadic eye movements facilitates integration of traumatic memories seems valid, however there is no research available to provide evidence for it. Thus, until proven, one must remain skeptical that the eye movements are necessary. The positive effects of EMDR may be due to its inherent similarity to Prolonged Exposure Therapy and other types of flooding. Indeed, the literature that provides evidence that the eye movements are necessary is so methodologically flawed it is almost welcome to read meta-analyses that do not cite primary sources in their literature reviews.

Future research into the effectiveness of eye movements for the treatment of PTSD and other anxiety disorders is highly recommended. Since eye movements are the focus procedure of EMDR, any rigorous contribution to the literature on this topic would be exceedingly valuable. It is also recommended that Stickgold's (2002) theory regarding saccadic eye movements and memory integration be investigated as well. As the foundation that EMDR rests on, this theory could make or break a case for eye movements.

The final key element of this controversy questions the efficacy of EMDR in the face of combat-related PTSD. Most studies that show that EMDR is effective do so only for civilian populations (Grainger, Levin, Allen-Byrd, Doctor & Lee, 1997; Silver, Rogers, Knipe & Colelli, 2005; Montgomery & Ayllon, 1994). The number of studies that look into EMDR use on combat vet-

erans is evenly divided.

As noted by Davidson and Parker (2001), one possible avenue for future research would be to conceptualize combat-related PTSD as a separate clinical population. Indeed, Jenson (1994) argues that Vietnam combat veterans diagnosed with PTSD should be considered distinct from civilians with PTSD. This would have implications for EMDR by explaining why EMDR and other flooding therapies are often unsuccessful treating combat veterans, but successful with civilian victims of trauma.

Combat is an extremely volatile form of trauma. Thus, treating PTSD that results from such a trauma is exceedingly difficult, regardless of which treatment a therapist wishes to employ. Whether or not combat-related PTSD is distinct from civilian PTSD, trauma resulting from combat is coupled with a variety of unique features. For example, those who experience war are often put into the difficult situation of experiencing multiple combat episodes. Thus, they are not given the opportunity to therapeutically confront a traumatic experience before they are thrust into another. Along these same lines, the nature of a military organization functions to encourage a mindset that tells a soldier to resist both mental and physical hardship. Thus, those who experience combat-related trauma may have an ongoing inner conflict over whether or not confronting a trauma and integrating it into memory is a positive thing. Combat-related PTSD is a fruitful area for future research.

Many of the articles reviewed were based upon well-designed methods. A few articles, however, lacked an efficient methodology. It is recommended that the literature on EMDR is robust enough at this point that casual and slack studies can safely be left unpublished. The progress of dismantling studies is progressing, though more research is necessary in order to get to the bottom of this controversial treatment.

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