

The Active Ingredient in EMDR: Is It Traditional Exposure or Dual Focus of Attention?

Christopher W. Lee,^{1*} Graham Taylor² and Peter D. Drummond¹

¹*School of Psychology, Murdoch University, Perth, Australia*

²*Private practice*

Very little is known about the mechanisms that underlie the therapeutic effectiveness of eye movement desensitization and reprocessing (EMDR). This study tested whether the content of participants' responses during EMDR is similar to that thought to be effective for traditional exposure treatments (reliving), or is more consistent with distancing, which would be expected given Shapiro's proposal of dual process of attention. The responses made by 44 participants with post-traumatic stress disorder (PTSD) were examined during their first EMDR treatment session. An independent rater coded these responses according to whether they were consistent with reliving, distancing or focusing on material other than the primary trauma. The coding system was found to have satisfactory inter-rater reliability. Greatest improvement on a measure of PTSD symptoms occurred when the participant processed the trauma in a more detached manner. Cross-lagged panel correlations suggest that processing in a more detached manner was a consequence of the EMDR procedure rather than a measure that covaried with improvement. Copyright © 2006 John Wiley & Sons, Ltd.

In 2000, guidelines from the International Society for Traumatic Stress concluded that eye movement reprocessing and desensitization was efficacious in the treatment of civilian PTSD populations (Chemtob, Tolin, van der Kolk, & Pitman, 2000). Since then, further studies have found that efficacy of EMDR is equivalent to or slightly better than traditional exposure-based treatments (Ironson, Freud, Strauss, & Williams, 2002; Lee, Gavriel, Drummond, Richards, & Greenwald, 2002; Power, McGoldrick, Brown, Buchanan, Sharp, Swanson, & Karatzias, 2002), although contrary findings have also been reported (Taylor, Thordarson, Maxfield, Fedoroff, Lovell, & Ogrodniczuk, 2003).

The mechanism that underlies the effectiveness of the EMDR procedure remains controversial

(Cahill, Carrigan, & Frueh, 1999). Some researchers have argued that the procedure works through mechanisms identical to that of imaginal flooding (Sanderson & Carpenter, 1992). In contrast, Smyth and Poole (2002) argued that, whilst imaginal flooding and EMDR are similar, in that both involve exposure to an aversive stimulus, in many ways the exposure conducted within EMDR is the antithesis of what has been considered necessary for habituation. The key differences are that the exposure is delivered in very short time intervals in EMDR instead of being continuous and prolonged, the eye movements are akin to a distraction task, and the client is instructed to simply remain aware of what arises rather than focus on the stimuli targeted for deconditioning. It is this last difference that is the focus of investigation in this paper.

Given its roots in conditioning theory, the essence of the exposure-based approach is on 'reliving' the trauma experience (Foa and Rothbaum, 1998). In

*Correspondence to: Christopher Lee, School of Psychology, Murdoch University, South Street, Murdoch, WA, Australia 6150. E-mail: chlee@murdoch.edu.au

traditional CBT treatment of PTSD, great care is taken by the therapist to have the client focus on as much detail of the trauma situation as possible. For example, Foa and Rothbaum (1998) stated 'I will ask you to recall these painful memories as vividly as possible. We call this 'reliving'. I don't want you to tell your story about the assault in the past tense. What I would like you to do is to describe the assault in the present tense, as if it were happening now, right here' (p. 162).

Similarly, Lyons and Keane (1989) emphasized that in the exposure phase of their treatment programme reliving the trauma material is crucial. They stated that the client needs to be encouraged to continue to revisit the particular components that cause most distress. The therapist redirects the client's thinking through re-telling to those sections.

Support for the importance of the reliving approach in traditional CBT was found in a process study (Jaycox, Foa, & Morral, 1998). They reported that participants who had high levels of emotional engagement and then showed subsequent reduction in SUDS scores improved most on PTSD measures. Participants who were lower on emotional engagement did worse. They concluded that the reliving process during treatment was critical because the client was able to establish that emotional engagement with the trauma memory was not dangerous and that the reliving allowed the person to distinguish better between re-experiencing and remembering.

Rather than reliving, EMDR appears to involve two quite distinct processes, distancing and free association. Instructions given to the client before and during the desensitization phase of the treatment encourage the person to take the role of observer of experiences in the session. In the introduction to the desensitization phase, Shapiro (1995) recommended to instruct the client to 'Imagine you are on the train and the scenery is passing by. Just notice the scenery without trying to grab hold of it or make it significant' (p. 107). Shapiro (1995) stated that an emphasis in the process has always been to 'Let whatever happens happen' and 'To just notice the trauma' (p. 322). This encouragement of the participant to be an observer of the traumatic event and develop this more distant strategy is similar to other practices of mindfulness and acceptance (Hayes, Strosahl, & Wilson, 1999; Kabat-Zinn, 1990; Linehan, 1993; Segal, Williams, & Teasdale, 2002). These instructions are in sharp contrast to the protocols for prolonged exposure, where the client's failure to focus

on describing the trauma is seen as avoidance and is actively discouraged by the therapist.

When the standard eye movement procedure does not result in a client reporting change, particularly when they are experiencing an intense emotional reaction, the therapist is even more directive in the encouragement of distancing. Shapiro (2001) suggested that the therapist direct the client to engage in perceptual manipulations of the trauma memory such as viewing the entire event as if it is projected on a TV screen, or to imagine erecting a bullet-proof glass barrier between the client and the event. Shapiro argued that this can be necessary to maintain what she described as a dual focus of attention. That is, the client is simultaneously aware of the trauma material but also of being in the present. The dual focus of attention concept refers to maintaining an optimal balance between a focus on the traumatic material and a sense of not being part of the trauma.

The second process during EMDR that differs from the reliving emphasis in traditional exposure-based therapies is that the person is permitted to experience associations to the original target image to emerge and be reported. This emerging material is accepted by the therapist, who continues to allow the client to focus on either the old or new material, providing that the client's responses continue to evolve and change. The assumption is that non-target traumatic stimuli are often associated with the targeted material in the client's memory network and therefore are a legitimate target for attention as this material can facilitate integration of the traumatic material with the client's other life experiences.

Although initially directed to recall emotions and cognitions connected to the target trauma, clients are also told it is very likely that they will not be able to do this and that focusing on auxiliary material is permitted. Shapiro (1995) pointed out that in many ways EMDR can be viewed as free association to the trauma material. EMDR allows the client to either make schematic links to associated material in the memory network or to continue to relive the experience, the latter being more akin to classical habituation (Lee, Gavriel, & Richards, 1996).

This study investigated the extent to which the client is involved in reliving, distancing, or focusing on other material during EMDR treatment. If improvement during EMDR has the same underlying mechanism as traditional exposure-based therapies, then the greatest reduction in the client's traumatic symptoms should follow sessions that

contain a greater proportion of specific trauma content. Based on the habituation model of exposure to trauma related material, greatest improvement should occur when the participant is completely involved in retelling the trauma event rather than being distant in the process or when the person is focusing on auxiliary events in life. Alternatively, Shapiro's (2001) description of the EMDR process emphasized a dual focus of attention. Based on this explanation greatest improvement should occur when the participant is focusing on the trauma with some distance.

METHOD

Design

All participants were treated for PTSD in one of two outpatient private practice settings. All sessions were natural treatment events. The measures used were part of routine clinical practice and decisions about when to treat and what to do in treatment were made solely on the basis of the treating practitioner's assessment of client needs and EMDR protocols. All participants were administered a structured interview by the treating clinician to establish diagnostic status. Immediately prior to the first EMDR desensitization session, an Impact of Event Scale (IES) was administered. This measure was repeated at the beginning of the following session. The dependent variable was the change in the scale scores between sessions. The therapist either recorded in writing the verbatim responses of the participants during the desensitization phase, or tape recorded the session and the responses were later transcribed. These responses were then coded by an independent rater, who was blind to the change in IES scores. The rater coded the responses of the participant after each set of eye movements to determine whether the person had described content consistent with reliving the trauma, content involving distancing from the trauma, content not directly involved with the trauma incident or a negative affective experience.

Participants

Although 56 potential participants were identified as seeking treatment for PTSD who had not previously received EMDR, five were found to not have had sufficient symptom severity at any stage since the trauma event to meet DSM-IV criteria. In addition, four participants were not given EMDR

because, in the opinion of the treating private practitioner, their level of emotional stability was not sufficient during the course of therapy for the procedure to be safe. Three of the participants were given EMDR but were excluded from the analysis because during the treatment they were given an 'unblocking' procedure (Shapiro, 2001) that involved redirecting the person to re-experience the target material (one participant) or to refocus on the trauma with greater sense of distance (two participants). Given the potential to complicate the interpretation of the results their data was excluded.

In the remaining 44 participants, the first EMDR desensitization session was analysed. The participants presented with traumas that included industrial accidents (six), motor vehicle accidents (12), sexual abuse (four), sexual assault (three), violent assault (14) and witnessing the death of another (five). There were 25 females and 19 males. The ages ranged from 15 to 67 years with a mean value of 40.07 ± 11.97 (\pm standard deviation). The mean number of desensitization sets in a session was 14.89 ± 5.40 .

Measures

Structured Interview for PTSD (SIP: Davidson, Malik, & Travers, 1997)

This required the clinician to assess the severity and frequency of particular symptoms associated with the DSM-IV diagnostic criteria for PTSD (American Psychiatric Association, 1994). Davidson et al. (1997) reported that the SIP has high internal consistency (Cronbach $\alpha = 0.80$), good test-retest reliability ($r = 0.89$) and satisfactory inter-rater reliability ($r = 0.90$).

Impact of Events Scale (IES: Horowitz, Wilmer, & Alvarez, 1979)

This is one of the most widely used self-report measures of post-trauma symptomatology. The IES assesses the extent of avoidance, numbing and intrusion symptoms. Its advantages are that it has been used across a number of different trauma samples and that it is very easy to administer (Newman, Kaloupek, & Keane, 1996). Coefficients of internal consistency across studies range from 0.79 to 0.92 and it has proven sensitivity to detecting treatment effects (Weis & Marmar, 1995).

Participant Response Classification

A rating system for coding the responses that each participant gave during the desensitization phase

of EMDR treatment was constructed. 'Reliving' was defined as any response that suggested that the person was re-experiencing the trauma with the perceptual or cognitive experiences that occurred at the time of the trauma, e.g. 'He is trying to hold my hand. I am pulling away', 'I'm waiting for a crash, I know it's going to happen'. Such responses were typically in the first person and present tense e.g., 'I am in the ambulance', 'I see her crawling away from me'.

The second category was 'distancing'. This referred to stimuli that were present at the time of the trauma event but the person described the event in a way that suggested that it was not happening now. The essence of this response was that the event was described with a detached quality. Often it consisted of the participant observing himself or herself in the event rather than a description of being in the experience. Alternatively, the material was described with alterations to the perceptual elements. Examples of this category included 'The faces seem all blurred', 'It's harder to see the knife', 'It doesn't seem so real; he [perpetrator of assault] is much smaller now'.

The third category was 'associated', which referred to any stimuli not present during the traumatic event. This included material pertaining to relationships that the person had in the general community, other events in their life including previous traumas, events relating to the participant's family of origin, difficulties the person had in life subsequent to the target trauma and even more neutral stimuli such as a sports programme seen on TV.

The fourth category was 'affect', which was given to any response that clearly indicated a negative emotion. This included words describing feelings such as terrified, angry or scared, and descriptions of physical sensations (e.g. really tight, sick in the stomach, pain in my back). Responses that contained an 'affect' response that was not clearly a negative experience (e.g. 'A kind of numb tingling feeling', 'less tense') were not classified as 'affect'. Some participant's responses after a set of eye movements could have both an 'affect' response and a content response ('distancing', 'reliving', or 'associated').

The raters were unable to determine whether 8.7% of the responses could be classed as any of the four primary categories. This occurred when a response contained both 'reliving' and 'distancing' content or when there was insufficient information in the response to determine a rating (e.g., in response to the question 'What are you aware of

now?' the participant replied 'Something grey' or 'Never again'). Given that the analysis was done on actual treatment sessions, the therapist did not elicit further clarification to assist in the future rating process to maintain fidelity with EMDR treatment protocols.

The raters met for 10 hours to determine a reliable coding system. At the end of this time each rater coded 10 identical records from PTSD clients not included in this study, which provided 214 data points. An analysis using Cohen's kappa indicated high inter-rater reliability (kappa value = 0.84, $p < 0.01$). To further assess the validity of the rating system, a third rater, who was also blind to the change in IES scores and to the hypotheses of the study, was trained for 4 hours in the derived rating system. Ten participant session transcripts were then chosen at random and the third rater's responses were then compared with the initial rater's responses. An analysis using Cohen's kappa indicated high inter-rater reliability (kappa value = 0.81, $p < 0.01$).

Procedure

The first two authors conducted the treatment provided in the study. Both were accredited with the EMDR International Association as 'approved consultants'. This study involved a natural observation of the therapeutic process. Thus, the therapist always provided the treatment that he judged to be most beneficial to the client, and the first EMDR session did not occur at the same session number for each participant. Additional therapy time was sometimes needed to develop rapport, discuss normal reactions to trauma, receive education about PTSD symptoms, develop skills to better regulate emotions, or have the therapist meet with the participant's partner to facilitate better understanding. This is in keeping with what Shapiro (2001) described in stages one to three of EMDR treatment. Eye movement occurs in the fourth stage of the procedure, which Shapiro labelled desensitization.

Every participant was given an IES at the beginning of the first desensitization session. The IES was then readministered at the start of the next session. The change in these scores was then compared with the content of the session. The desensitization stage began with the therapist instructing the client to recall the targeted trauma image, to repeat the negative self-belief associated with this and to notice the emotions or somatic sensations

Table 1. Type of participant response as a percentage of his/her total responses and correlations between each of the primary process variables and the pre-treatment variables

	Mean proportion (%)	Standard deviation (%)	Correlations		
			Session number	Pre-treatment IES	Age
Distancing	26	18	-0.09	0.25	0.15
Reliving	16	16	0.12	-0.14	0.28
Associated	22	22	0.41*	-0.08	0.08
Affect	38	22	-0.39*	0.14	-0.17

*Correlation is significant at the 0.01 level (two tailed).

Percentages do not add up to 100 as not all responses were classifiable and some responses had both a content and 'affect' code.

present. The client was told to notice where in the body he or she felt distress. The therapist then instructed the client to follow the therapist's fingers with his or her eyes.¹ After a brief period (minimum 24s) the clinician stopped the eye movements and said 'Rest. Take a break' or 'Let it go' or 'Take a deep breath'. The therapist then asked 'What do you get now?' or 'What do you notice now?'. It was the client response to this probe that was recorded and subsequently coded by the rater.

In accordance with EMDR procedure, the therapist's immediate response to the participant's report was to state 'Stay with that' or 'Notice that' or 'Go with that' and to begin to move the fingers, which implicitly invited the client to follow with his or her eyes. These responses were given independent of whether the participant reported a positive or negative experience. However, if the participant gave a positive response (either a positive thought or affect) and then the response to the subsequent eye movement set did not significantly change, he or she was asked to recall the original trauma and describe it. This occurred an average of 1.71 times per participant. The next step was to obtain a SUDS (Subjective Units of Discomfort Scale) rating of the memory. If the rating was above one, desensitization continued as above; if one or below, desensitization was concluded.

¹Shapiro (2001) noted that other stimuli, besides eye movement, can be effective in achieving accelerated information processing. For instance, alternating bilateral hand taps and auditory tones have also been advocated. The therapists used these procedures for only three participants.

RESULTS

The mean score on the SIP was 34.85 ± 8.13 . This is similar to the mean scores reported in other treatment studies, which range from 30.4 to 39.7 (Davidson et al., 1997; Lee et al., 2002; Vaughan et al., 1994).

The mean score on the IES at the beginning of the desensitization stage was 39.91 ± 14.06 , with a range from 20 to 66. This is somewhat lower than other studies of trauma populations, where the mean score has ranged from 46.8 to 55.3 (Lee et al., 2002; Vaughan et al., 1994). This probably reflects differences in when the measure was administered. The measure was given in this study just prior to desensitization, whereas the other studies cite scores from when the participant was first seen. The mean of the change in IES scores after the single desensitization session was a decrease of 16.50 ± 8.56 . The change in IES scores ranged from a decrease of 31 to an increase of 4.

The number of 'distancing', 'reliving', 'associated' and 'affect' responses to each set of eye movements was summed for each participant. This sum was then divided by the total number of sets in the session for the participant to give a ratio. The mean and standard deviations of these subsequent ratios for the 44 participants are presented in Table 1, along with the Pearson correlation values for all of the numeric demographic data. As can be seen from this table, none of the correlations between any of the process variables and age were significant. Nor were there any significant associations between the process variables and the participant's score on the IES prior to the first EMDR session.

EMDR was administered at different times in each participant's therapy. The modal point was the third session (mean = 3.95 ± 3.31) but it ranged

from the first session (one participant only) to the 15th. The effect of this on the process variables was investigated. There was a significant association between session number and 'associated' ($r = 0.41$, $p < 0.01$) and between session number and 'affect' ($r = -0.39$, $p < 0.01$). However, session number was not significantly associated with 'distancing' or 'reliving' (see Table 1).

The other demographic variable that could have affected the process variables was sex. However, there were no significant effects of sex on 'reliving', $t(42) = -1.35$, $p > 0.05$, 'distancing', $t(42) = 0.88$, $p > 0.05$, 'associated', $t(42) = -0.46$, $p > 0.05$, or 'affect', $t(42) = 0.55$, $p > 0.05$.

The effect of participant demographic variables on change in IES scores was assessed. Using a two-tailed test of significance neither age ($r = 0.21$, $p > 0.05$), session number ($r = 0.07$, $p > 0.05$) nor sex, $t(42) = 0.71$, $p > 0.05$, was significantly associated with change in IES scores. However, pre-treatment IES scores were associated with change in IES scores ($r = 0.31$, $p < 0.04$), indicating that IES scores decreased more in participants with the highest pre-treatment scores.

The main hypothesis concerned whether the process variables were associated with change in IES scores (see Table 2). The only process variable that was related to change in IES scores was 'distancing' ($r = 0.48$, $p < 0.001$). The hypothesis that 'reliving' would be associated with greater improvement was not supported ($r = -0.07$, $p > 0.05$). Given the significant association between session number and two of the process variables, correlations were also calculated between all four process variables after controlling for the effect of session number. 'Distancing' remained the only process variable associated with change in IES scores (see Table 2). 'Distancing' also remained the only process variable associated with change in IES scores after

controlling for the effect of pre-treatment IES scores and session number (see Table 2).

The association between each of the process variables was investigated. As can be seen from Table 2, the only correlation between the process variables that proved significant was 'associated' with 'affect' ($r = -0.56$, $p < 0.001$).

Given that distancing was associated with improvement, it was important to understand whether or not people simply distanced more as they improved, or whether the procedure led to more distancing, which in turn led to symptom reduction. Cross-lagged panel correlation analysis was undertaken to address this issue, examining the relationship between initial distancing, distancing at the end, symptom level at the start of the session and symptom level after the intervention. Initial distancing was calculated by summing the number of distancing responses during the first three sets, and distancing at the end was calculated as the sum of all the distancing responses in the last three sets for each individual. The resulting correlations are presented in Figure 1.

After controlling for pre-treatment symptom scores and distancing at the end of the EMDR session, the correlation between initial distancing and post-treatment symptom scores was significant ($r = -0.29$, $p < 0.05$). This is consistent with the idea that distancing produced a reduction in symptoms. The data was not consistent with the view that distancing was more likely to happen for people who were less distressed, since pre-treatment symptom scores were not related to distancing at the end of the EMDR session ($r = 0.06$, $p > 0.05$). The other cross-lagged diagonal in Figure 1 tests this association after controlling for initial distancing and symptoms post treatment. The correlation remained non-significant ($r = 0.17$, $p > 0.05$).

Table 2. Intercorrelations of process variables, correlations of participant responses with change in the IES scores (baseline minus final score) and correlation with IES scores after partialling out potentially confounding variables

	Distancing	Reliving	Associated	Affect
Reliving	-0.09			
Associated	-0.28	0.16		
Affect	-0.13	-0.26	-0.56**	
Change in IES	0.48**	-0.07	-0.09	-0.08
Change in IES controlling for session number	0.51**	-0.10	-0.19	-0.01
Change in IES controlling for session number and IES-Pre	0.46*	-0.05	-0.16	-0.07

** Correlation is significant at the 0.001 level (two tailed).

* Correlation is significant at 0.005.

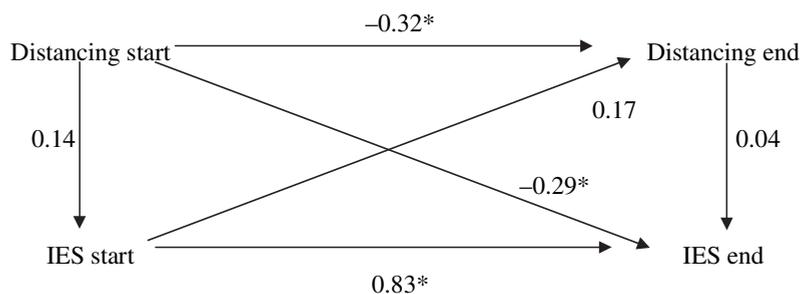


Figure 1. Correlations between IES scores and distancing at beginning and end of treatment. The diagonal values are the partial correlations after controlling for within-time associations

*Correlation is significant at the 0.05 level

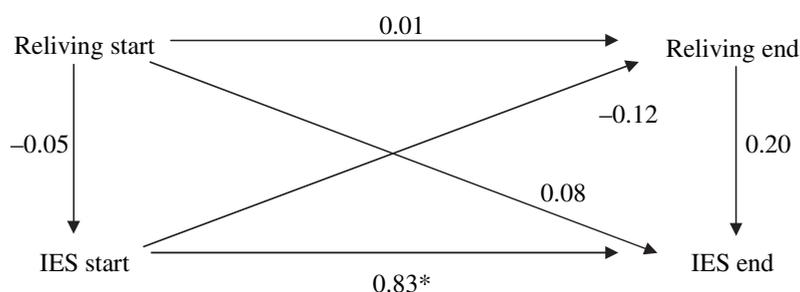


Figure 2. Correlations between IES scores and reliving at beginning and end of treatment. The diagonal values are the partial correlations after controlling for within-time associations

*Correlation is significant at the 0.05 level

A cross-lagged analysis was also undertaken for reliving. None of the relationships between reliving and symptom severity were significant (see Figure 2).

Given that the distribution of some of the process variables appeared skewed, log transformations were computed. However, none of the correlations reported above involving the process variables were altered in any substantial way.

DISCUSSION

The hypothesis that 'reliving' responses would be associated with more improvement in symptoms than 'distancing' or 'associated' responses was rejected. Thus, the theoretical position that improvement as a result of EMDR desensitization is similar to that which occurs during the process of imaginal exposure was not supported in this study.

The only process variable that was significantly related to improvement was 'distancing'. This

finding proved particularly robust. Even after controlling for possible contaminating variables such as initial trauma severity, as indicated by scores on the IES, and the session number when desensitization was administered, 'Distancing' responses were moderately associated with improvement. This finding supports the view that the dual focus of attention in the desensitization phase of EMDR is an important part of the therapy.

Cross-lagged correlations between distancing responses and symptoms support the notion that distancing was an important part of the therapeutic process rather than a secondary outcome of the treatment. A problem with cross-lagged analyses such as these is that on their own they do not add up to a causal argument and do not replace experimental designs that directly test causation (Kenny, 1975). Nevertheless, an examination of the relevant lagged associations indicated that, after controlling for initial pre-treatment scores and distancing at the end, the correlation between initial distancing and IES scores post-treatment was significant. The

results did not support competing notions that these factors merely co-vary or that initial symptom level affected distancing.

During EMDR, the therapist actively encourages the client to simply observe his or her response to the memory of a trauma event. Many of the directions given to the client (such as the metaphor involving the train and directions during desensitization to 'just notice') are likely to promote 'distancing'. However, therapist instruction may not have been the only factor to produce the distance response. The eye movements themselves may produce this effect. Four studies that examined the effect of eye movements on autobiographical memory of negative events suggest that pairing eye movements with memories resulted in a reduction in vividness and associated negative emotions (Andrade, Kavanagh, & Baddeley, 1997; Barrowcliff, Gray, Freeman, & MacCulloch, 2004; Kavanagh, Freese, Andrade, & May, 2001; van den Hout, Muris, Salemink, & Kindt, 2001). The reduction in negativity and vividness was not found with another dual attention task such as tapping (van den Hout et al., 2001), nor on a comparative non-memory task (Andrade et al., 1997), nor when compared to exposure alone (Kavanagh et al., 2001). However, the treatment effect of eye movements has not always been clearly demonstrated. A meta-analysis of treatment studies found no incremental increase in effect size for eye movements above no eye movements and alternative stimulation (Davidson & Parker, 2001). This finding is complicated by the inclusion of some studies with serious methodological flaws that have been discussed in detail in other reviews (Lee et al., 1996; Maxfield & Hyer, 2002; Shapiro, 2002). In addition, Davidson and Parker (2001) noted that their data indicated that the difference in effect size between EMDR with eye movements and EMDR without eye movements was 'marginally significant if one examines only clinical populations satisfying [DSM] diagnostic criteria' (p. 311).

Procedures that distract the client from the feared stimulus would be expected to reduce the rate of habituation (Foa & McNally, 1996). In contrast, in this study the EMDR procedure, which involved a distraction component of eye movements, as well as an encouragement of distancing, was linked with a better treatment outcome. Distraction tasks have been observed in other more recent studies to facilitate exposure (Oliver & Page, 2003; Penfold & Page, 1999). However, these findings are at odds with earlier work (Rodriguez & Craske, 1993, 1995).

There are three current explanations of how an external stimulus such as eye movements facilitates processing of trauma memories in EMDR. One model hypothesizes that bi-lateral eye movement facilitates interhemispheric interaction, which then improves the processing of trauma-related memories. It has received empirical support in that saccadic movements (but not vertical or horizontal smooth pursuit) have been found to enhance processing of episodic memories (Christman, Garvey, Propper, & Phaneuf, 2003; Christman, Propper, Dion, 2004). The other two models both consider that the eye movements produce an effect that is part of the orienting response but differ in the subsequent effect of this response on processing. The current study has some indirect implications for these two models.

According to MacCulloch and Feldman (1996), the investigatory component of the orienting response could either produce avoidance behaviour or inhibit avoidance responses, including cognitive and negative somatic responses, and allow fresh investigatory behaviour to commence. They proposed that providing no danger was identified the investigatory reflex induces a positive physical response. In their opinion the eye movement induces this investigatory reflex and produces a relaxation response. Support for this belief was obtained in a study that investigated the autonomic responses of participants when they were engaged in an eye movement task as part of EMDR treatment (Wilson, Silver, Covi, & Foster, 1996). Galvanic skin responses consistently decreased, suggesting a relaxation response, and respiration synchronized with rhythm of the eye movements in a shallow regular pattern. Barrowcliff et al. (2004) also found that electrodermal arousal to autobiographical memory decreased following an eye movement task but not in an eye stationary condition. In line with this explanation, the eye movement task should be of sufficient novelty to induce the orienting response but not too demanding to prevent simultaneous access to the trauma material. Consistent with this idea was the finding that EMDR treatment was associated with increased left pre-frontal hemisphere activation (Levin, Lazrove, & van der Kolk, 1999) and that investigatory and approach behaviour has been shown to be associated with the anterior left hemisphere regions (Kinsbourne, 1978). Thus if the eye movements produce this orienting response by providing an alternative focus that is novel and stimulating (but not too demanding), and an associated effect of this is a reduction in arousal, then

this enables approach behaviour towards the previously negative stimulus. The current study suggests that the negative stimulus is then perceived in a more distant manner.

The finding of a significant negative correlation between 'affect' and 'associated' responses is consistent with an alternative use of the orientating response to explain the underlying mechanism of EMDR described by Stickgold (2002). He proposed that PTSD occurs when an event is sufficiently arousing to prevent its transfer from encoding as an episodic memory to a semantic memory. As a result of high arousal levels, associations between the trauma event and other related events fail to develop. He argued that similar biological mechanisms in EMDR and REM sleep weaken trauma-related information that is closely associated with a target event, and strengthen ancillary information loosely related to the event. According to this theory, recovery from PTSD would be accompanied by more associative responses. However, in this study 'associated' responses were not related to improvement.

There was a statistical link between when the person received EMDR and the type of response given by the participant. The later in the participant's treatment the therapists chose to administer desensitization the less likely the client gave 'affect' responses. Thus participants who the therapist judged as likely to be overwhelmed by negative affect when undergoing EMDR were given other treatments to help contain their distressing emotions. It appears that these auxiliary treatments led to less negative affect being present in the EMDR treatment sessions. Also, the later in the participant's treatment the therapist chose to administer desensitization the more likely it was that the client gave 'associated' responses. A possible explanation for this finding is that participants whose desensitization treatment was delayed are more likely to have been given some cognitive therapy. Cognitive therapy often involves helping the participant think beyond the immediate situation and draw from other life experiences. In this way the participant can decrease overgeneralizations, for example, 'Although that man was abusive not all men I have known were abusive' or alter emotional reasoning, 'Other times I have felt scared, and I wasn't in danger' (Foa & Rothbaum, 1998). Such treatment may have increased the likelihood that the participant recalled associated life experiences during the desensitization phase.

Unlike the 'associated' and 'affect' responses, neither 'distancing' nor 'reliving' was related to

'session number' (i.e. when desensitization was administered). This suggests that the therapist's treatment of the client prior to desensitization did not systematically affect the only process variables shown to relate to outcome ('distancing'). In addition, it suggests that the therapist's treatment of the client prior to desensitization did not have any effect on the variables associated with the two main hypotheses described above.

Potential Study Limitations

The optimal time to examine the association between type of response and change in symptoms would be immediately after the intervention. This is difficult when assessing post-trauma symptoms. The outcome variable chosen assessed the amount of intrusion and avoidance symptoms in the previous week. This meant that at least a week had to elapse before the effect of the intervention could be studied and leaves the treatment effect open to the influence of other variables. The only alternative would be to measure another facet of PTSD symptomatology such as increased arousal. However, a subjective measure of increased arousal (e.g. SUDS scores) would not be informative because most ratings at the end of the session were very low. Another alternative would be a physiological measure, but these have been found to be relatively insensitive to treatment effects within sessions (Boudewyns & Hyer, 1990). In any event, there appears no obvious way that the week delay in measuring symptoms would have differentially affected the impact of 'distancing' versus 'reliving'.

Second, whilst this study demonstrated a clear link between distancing and reduction in symptoms, the link does not establish causality. This needs to be tested more directly by manipulating the extent of distancing during the treatment and studying the subsequent effect. A future study might also test the relative contribution of therapist instruction and eye movements to the distancing process and to treatment outcome.

Conclusions

This study provided further weight to the notion that the active processes during EMDR and that of traditional exposure are different (Rogers & Silver, 2002). A distancing process that occurs during EMDR treatment was associated with more improvement than when participants relived the trauma experiences. The distancing may be partly facilitated by the distraction of the eye movement task. It might also be facilitated by the therapist

encouraging a dual focus of attention, that is, simultaneously being aware of the trauma material and of being in the therapist's office.

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