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# Eye Movement Desensitization and Reprocessing (EMDR) and the Anxiety Disorders: Clinical and Research Implications of an Integrated Psychotherapy Treatment

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**Abstract**—Four recent, independent, rigorously controlled studies of Eye Movement Desensitization and Reprocessing (EMDR) have reported that 84 to 100% of single-trauma victims no longer maintain the posttraumatic stress disorder diagnosis after the equivalent of three 90-minute sessions. The rapidity of EMDR treatment effects makes many ancillary research opportunities available. Specifically, the increased number of cases resolved in a relatively short period of time allows investigation of neurophysiological phenomena, patterns of cognitive and emotional processing, component analyses of a large range of procedural factors, and evaluation of the efficacy of application to diverse clinical populations. Unfortunately, some research has been conducted that has been severely hampered by insufficient treatment fidelity and lack of clinical validity. Consequently, this article will attempt to describe the procedures and protocols that are believed to contribute to EMDR's clinical effects and are, therefore, suggested for the EMDR treatment and research of the anxiety disorders. This is particularly relevant given the misconceptions that have abounded due to the unfortunate naming of the procedure after the eye movements, which have proved to be only one of many useful types of stimulation, and only one of many components of this complex, integrated treatment.


Eye Movement Desensitization and Reprocessing (EMDR) was introduced into the field of psychology by means of a controlled outcome study (Shapiro, 1989a) that assessed a one-session application of what was then termed *EMD* to the treatment of disturbing memories associated with Posttraumatic Stress Disorder (PTSD) symptomology. Given the paucity of controlled treatment outcome literature with people suffering from PTSD (Hyer,

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1994; Shapiro, 1996a; Solomon, Gerrity, & Muff, 1992), the effectiveness of the procedure in treating this population was subjected to intense scrutiny, leading, in a relatively short period, to over a dozen additional independent controlled evaluations (Shapiro, 1995, 1996a, 1998). Following a pattern common to most areas of research, seriously flawed early studies of PTSD treatments procedures (see Foa & Meadows, 1997; Shapiro, in press) have been replaced by studies that entail greatly improved methodology, procedures, and experimental design. In 1995, the American Psychiatric Association (APA) Division 12 (Clinical Psychology) initiated a project to determine the degree to which extant therapeutic methods were supported by solid empirical evidence. The increase in methodological rigor in EMDR studies involving civilian PTSD recently led independent reviewers to place EMDR on a list of "empirically validated treatments," as "probably efficacious for civilian PTSD." At the same time, exposure therapy (e.g., flooding) and stress inoculation therapy (SIT) were described as "probably efficacious for PTSD," while no other therapies were judged to be empirically supported by controlled research for any PTSD population.

Evaluators assigned to this list only those forms of therapy they considered to have been supported by controlled experiments, while making no comparisons *between* treatments. Further, a meta-analysis of all psychological and drug treatments for PTSD reported that EMDR is effective for PTSD and is more efficient than other treatments (Van Etten & Taylor, 1998). It is of interest, therefore, to attempt to make such comparisons by examining the relevant supportive data and their implications. Because many of the controlled studies of treatments that used *multiply* traumatized combat veterans as their clinical population are plagued by a variety of methodological problems, including restricted treatment time (discussed in a later section), a review of the *single*-trauma PTSD research will prove more informative.

Four controlled studies of the effectiveness of EMDR on single-trauma PTSD were carried out recently by independent research teams, using a total of 107 EMDR subjects (Marcus, Marquis, & Sakai, 1997; Rothbaum, 1997; Scheck, Schaeffer, & Gillette, 1998; Wilson, Becker, & Tinker, 1995, 1997). In contrast, one controlled study of the use of flooding, or SIT, with single-trauma PTSD victims, has appeared in a peer-reviewed journal, consisting of only 10 single-trauma PTSD victims at posttest in each of its two conditions (Foa, Olasov Rothbaum, Riggs, & Murdock, 1991). The only additional published controlled studies of exposure with single-trauma PTSD victims evaluated a combination of imaginal and *in vivo* exposure with 14 patients (Richards, Lovell, & Marks, 1994) and, more recently, a similar protocol was tested with 20 patients (Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998). All of these studies of exposure entailed 7 to 10 treatment sessions and daily homework. The results of the Foa et al. (1991) study revealed that 55% of the

subjects were no longer diagnosed with PTSD at posttest, after having received approximately 25 hours of exposure, while in the study by Richards et al. (1994), 80% of the subjects no longer qualified for the diagnosis of PTSD after undergoing approximately 50 hours of exposure. Similar results were reported at posttest by Marks et al. (1998) after approximately 100 hours of exposure. It should be noted that compliance to exposure homework is considered to be correlated with positive treatment effects (Marks et al., 1998; Richards et al., 1994; Scott & Stradling, 1997). In contrast, the four studies of EMDR mentioned above using comparable accepted standard measures (Strupp, Horowitz, & Lambert, 1997) and independent assessors, demonstrated that after the equivalent of three 90-minute sessions (i.e., 4.5 hours), but without homework, 84 to 100% of the single-trauma subjects were no longer diagnosed with PTSD at posttest (Shapiro & Forrest, 1997 for transcripts of EMDR treatment sessions).

When the successful treatment of a previously resistant traumatized population is consistently achieved in only three sessions, many ancillary research questions are more easily examined. That is, the increased number of cases resolved in a relatively short period of time greatly facilitates (a) the investigation of underlying neurophysiological processes (e.g., Levin, Lazrove, & van der Kolk, 1999 [this issue]; van der Kolk, Burbridge, & Suzuki, 1997), (b) the identification of patterns of cognitive and emotional processing (Shapiro, 1995), and (c) the assessment of the specific roles played by the individual components of which the procedure is composed. The remainder of this article will discuss the procedures and protocols believed to contribute to EMDR's clinical effectiveness with respect to the anxiety disorders, and to attempt to dispel certain mistaken beliefs about this method.

## PROCEDURAL ELEMENTS

Contrary to a common misconception, EMDR, as it is currently practiced, is not a simple, by-the-book procedure dominated by the use of repeated eye movements (despite its name), but rather an integrated form of therapy incorporating aspects of many traditional psychological orientations (Shapiro, 1995) and one that makes use of a variety of bilateral stimuli besides eye movements. The inaugural study (Shapiro, 1989a) did indeed stress directed eye movements as the primary component of the therapy. This incorrect and unfortunate interpretation of the method can be explained by the author's concentration on the concrete actions in which she was engaging during therapy, rather than on the attendant complexity of the methodology actually employed and the underlying processes thought to be engendered by it. Thus, even at this early stage in its development, EMDR consisted of a great many elements which, besides the eye movements, included creation and dismissal

of imagery, cognitive assessment, cognitive restructuring, alignment of sensory input related to the targeted trauma (described below), sequential targeting of information, and dosed exposure. By the time the second article appeared (Shapiro, 1989b), EMDR had changed by the addition of elements of free association and delineation/awareness of physical sensation. Further refinement of the methodology, primarily as a result of numerous clinical observations (Hoshmand & Polkinghorne, 1992), has occurred over the subsequent decade (Manfield, 1998; Shapiro, 1991a, 1991b, 1995, 1998; Shapiro & Forrest, 1997).

Unfortunately, a number of literature reviews have assumed that the current methodology is based upon the procedure and interpretations that were reported in the early articles and have thus included serious misinformation. One example of such outdated information is the claim that EMDR effects are sequentially evaluated through numerous reports of Subjective Units of Disturbance (SUD Scale; Wolpe, 1958), a procedure that may be criticized for placing the client under the influence of potential therapist/experimenter demand characteristics and perhaps even coercion (e.g., DeBell & Jones, 1997; Foa & Meadows, 1997; Tolin, Montgomery, Kleinknecht, & Lohr, 1995). However, this form of treatment has not been advocated in training for 8 years (see below and Shapiro, 1995). Another error in many reviews of the EMDR literature is the claim that proponents of this procedure attribute its therapeutic effects primarily or solely to the eye movement component (e.g., Foa & Meadows, 1996; Lohr, Kleinknecht, Tolin, & Barrett, 1995). However, as indicated above, this position has not been held since the early 1990s (e.g., Shapiro, 1991a, 1994, 1995; see also Allen, Keller & Console, 1999; Lipke, 1999; Shapiro, 1996b). Clearly then, there is a need to describe for readers the *current* clinical practice of EMDR and the theoretical framework on which this method is assumed to be based.

EMDR is currently an eight-phase treatment approach that undoubtedly includes a number of elements that could be viewed as "nonspecific" factors (e.g., therapeutic alliance, expectancy; Arkowitz, 1992; Frank & Frank, 1991; Greenberg & Newman, 1996). However, the more rapidly achieved clinical effects of EMDR compared to those of other PTSD treatments (e.g., Brom, Kleber, & Defares, 1989; Foa et al., 1991; Richards et al., 1994; Marks et al., 1998; Resick & Schnicke, 1992) and the substantial clinical improvement of EMDR treatment subjects over active controls demonstrated in a number of controlled studies (e.g., Carlson, Chemtob, Rusnak, Hedlund, & Muraoka, 1998; Marcus et al., 1997; Scheck et al., 1998) indicate that this method entails genuine treatment-specific factors. Furthermore, discrepancies that exist in current research (see discussion below on multiple-trauma victims and phobias) might well be resolved if each of the procedural elements recommended for the clinical application of EMDR were actually included in future studies of the method. Both research and clinical treatment would benefit from the

closer correspondence in methodology that this would ensure, particularly if research findings are to indicate the need for a change in practice. Therefore, the eight phases of EMDR will first be delineated, with attention to many of the aspects of treatment that are believed to be clinically effective, and then various additional procedural elements that should also be the foci of component analyses will be examined. In subsequent sections, some of the current research on the effects of EMDR on anxiety disorders will be assessed in terms of its adherence to protocols, and specific recommendations will be made for the implementation of both internally and externally valid research on treatment outcome and component analyses.

## EIGHT PHASES OF EMDR TREATMENT

As previously noted, the methodology of EMDR has undergone substantial modification as a result of almost a decade of clinical observation. While the three-session positive effects of EMDR have been well-documented in controlled research, process analyses are scarce (e.g., Rogers et al., 1999 [this issue]; D. Wilson, Silver, Covi, & Foster, 1996). Therefore, the present discussion attempts to provide the reader with a greater understanding of the procedures, assumptions, and clinical observations that currently guide EMDR clinical practice and, in the process, to correct possible misconceptions and to encourage and provide a springboard for future research on this procedure. Naturally, given the space constraints of the present article, only a brief overview can be offered (for further details, however, see Shapiro, 1995).

The first of the eight phases of EMDR is *Client History and Treatment Planning.* A thorough screening is completed to assess client readiness and identify any secondary gains that may accrue to the client from the pathology. These issues are addressed by means of a concrete plan of action incorporating specific behaviors to resolve the presenting concerns. The clinician then evaluates the client's entire clinical picture, including dysfunctional behaviors, symptoms, and characteristics and then identifies suitable foci for treatment. These targets, which are chosen because they appear to the therapist to set the basis for the client's pathology, are then prioritized for sequential processing. Within the context of EMDR treatment, the term *processing* refers to active learning. More specifically, it is posited that human beings possess a physiologically based information-processing system that, under normal circumstances, will naturally respond to and resolve everyday minor disturbances. However, when a trauma occurs, this system can become imbalanced, causing the information to become "locked in the brain" in the form it was input. Thus, it is hypothesized that during a serious traumatic event the perceptions (e.g., the rapist's face, breath, etc.) experienced by the individual are stored in a "state-dependent" fashion. This information remains in neurobiological stasis (van der Kolk, Greenberg, Boyd, & Krystal, 1985) and is thus incapable of

effecting the appropriate connections that would allow the resolution of the traumatic event to occur. Processing (or reprocessing) is thus defined as the forging of the associations required for learning to take place as the information pertaining to the traumatic event is "adaptively resolved." Such a resolution is said to have been achieved when the client (a) has gleaned from the traumatic experience that which is useful (e.g., the appropriate caution in certain situations or around certain people) and discarded that which is useless and self-defeating (e.g., the emotional disturbance, negative sensations, irrational cognitions, etc.), (b) has acquired (or reacquired) the ability to experience and manifest the appropriate affect with respect to the traumatic event, and (c) has acquired the capacity to effectively guide his/her future actions.

EMDR targets not only the memories that have been implicated in the pathology, but also the present situations that stimulate emotional disturbance and the specific skills and behaviors that will be needed by the client for the future. The clinician's choice of targets must take into account certain delineated patterns of generalization that have become apparent on the basis of much clinical evidence. For instance, it appears that successful treatment does not necessarily require that each and every dysfunctional memory of the client be targeted. Rather, if a cluster of similar experiences (e.g., several related instances of molestation by the same perpetrator) is known to exist, only one representative event from this group need be treated. Such generalization of treatment effects should not be expected if the client reports a variety of dissimilar events and triggers and thus each of these must be reprocessed separately (Shapiro, 1995).

Phase Two is termed *Preparation* and involves establishing an appropriate therapeutic relationship, setting reasonable levels of expectation, educating the client regarding his/her symptomology, establishing an appropriate client perspective to the active processing of the trauma, and training the client in the use of a set of specific coping skills and self-control techniques for the purpose of rapidly eliminating disturbance and accessing positive affects (Shapiro, 1995). It is assumed that avoidance behavior is likely to be manifested by the anxiety-disordered client at the outset of treatment and that it will therefore be necessary to address this issue before serious attempts at reprocessing can begin. Self-control techniques are an important element of treatment and are used to "close" incomplete sessions and to maintain client stability between and during sessions. In addition, clients are instructed (a) in the use of helpful metaphors (e.g., to imagine themselves as being on a train and to think of the disturbance they may be experiencing as merely the scenery passing by), (b) to maintain a balanced observation/participation position, and (c) in the use of a stop-signal to provide a sense of control over the events that are occurring during the treatment session.

During *Assessment*, the third phase, the therapist and client jointly identify the memory that will serve as the target for that session, along with its associated mental image, beliefs, emotions, and physical sensations. Baseline measures of responses are then taken. Each of the components of the assessment phase and the order in which they are addressed have been clinically refined over the years. For instance, the representative and/or most salient mental image of the traumatic event is first identified and serves as (a) an easily accessed manifestation of the stored experience integrally linked to the associated fears, and (b) a circumscribed representation of the target that allows the client to maintain a sense of equilibrium due to the previously taught self-control skills. The clinician next assists the client to elicit the negative belief (the cognition that he/she most closely associates with the traumatic event). Presumably, this second part of the Assessment phase allows the client to (a) begin to appreciate the irrationality of his/her cognitive interpretation of the event, (b) put into actual words that which the client may have previously experienced only as "speechless terror" (Rauch et al., 1996), and (c) identify an additional focal point to help activate the feared information. The third step is to elicit from the client a *positive* belief that seems especially suited to the target. This step serves to (a) facilitate the client's awareness of cognitive distortion that they are currently experiencing, (b) introduce information that contradicts his/her negative emotional experience, and (c) offer the client a "light at the end of the tunnel," thereby encouraging and motivating him/her to stay with treatment. Treatment effects appear to be maximized by choosing a positive cognition that is not only ecologically valid (i.e., applies to their everyday world), but has the greatest likelihood of generalizing to a wide range of associated information (Shapiro, 1995). The Validity of Cognition (VOC) scale provides both client and clinician with a baseline with which to assess the appropriateness of the chosen cognition and a given session's progress, thereby further promoting client treatment adherence. Procedurally, the cognitive exercises are introduced and explicitly connected to the disturbing material as represented by the chosen image. However, they are concluded before the traumatic information is fully stimulated in order to prevent interference from intense affective arousal.

Following the identification of the positive cognition, the image and the negative belief are paired in order to facilitate access to the stored memory of the trauma. The emotion, SUD score, and location of physical sensation are then identified. Explicitly labeling the emotion allows the clinician to (a) offer the appropriate verbal support, (b) anticipate any beliefs that might block processing and which, therefore, need to be addressed, and (c) establish a response baseline. It is not unusual for the client to access and process a large number of emotions during an individual session. It might be assumed that if the client's SUD level remains unchanged by the end of a given session, and

with no specific emotion identified, the treatment for that session had been unsuccessful. This is not necessarily true, however, since clinical progress may have actually occurred, although not in terms of a change in the numerical value of the SUD level, but rather in the form of the *type* of emotion being represented (e.g., a switch from shame to anger).

Identification of the physical sensation is considered to be a very important aspect of EMDR treatment. The client's awareness of the physical correlates of the stored traumatic event appears to represent an important focal point for both activating the dysfunctional material and facilitating its reprocessing. Since the client is trained to simply observe, rather than to manipulate, the changes of information occurring during processing, he/she is not asked to describe the concomitant physical sensations but rather to identify their bodily location. These physical sensations are generally associated with either the emotional content (e.g., fear, shame, anger, etc.), of the memory or the physical experience of the event itself (e.g., the grip of the perpetrator's hand, physical blows, etc.). Neurobiological researchers have argued that state-dependent information storage in implicit memory includes the unresolved traumatic material, and typically the affect and physical sensations that were experienced at the time of the event as well (Siegel, 1996; van der Kolk, 1994). Similarly, clinical observations of EMDR sessions (Shapiro, 1995; Shapiro & Forrest, 1997) reveal that once the traumatic material has been resolved, these physical sensations (and affective states) are no longer evident. Further, educating the client to identify the concomitant physical sensations serves as a means of focusing their attention on a less threatening and less potentially judgmental manifestation of the stored experience. That is, rather than allowing the client to become overwhelmed by negative self-recriminations or disturbing pictures, he/she is often asked merely to attend the physical sensations, an act which often serves to facilitate the processing. In addition, when clients come to realize that their responses are simply "manifestations of their nervous systems," for which they are not personally responsible, they frequently appear comforted as well as motivated to continue treatment. Finally, the identified image, negative belief, and physical sensations are simultaneously maintained in consciousness by the client to access the stored traumata during the initial set of stimulations.

The next three EMDR phases involve the component of bilateral stimulation (by means of sets of eye movements, tones, or taps) together with procedural elements designed to facilitate the information processing (Shapiro, 1995). Phase Four is called *Desensitization* because it evaluates the client's disturbance as measured by the SUD Scale. However, this phase comprises all responses, including the elicitation of insights, changes in trauma-related sensory experience, associations, and increased sense of self-efficacy. As previously noted, the EMDR procedures have emerged from and been modified by numerous clinical observations born of the rapid treatment effects. These

procedures were designed to (a) facilitate the most rapid processing of information possible, while (b) assuring a stable client who feels safe and in control of both process and outcome. For instance, the client is asked to focus on a target while the eye movements (or other stimuli) are initiated, and, rather than asked to maintain the target in consciousness, is instructed to "let whatever happens, happen." This openness to whatever happens (a) reduces demand characteristics and the client's likely "fear of failure" and (b) allows a spontaneous association to occur, which, according to clinical reports, appears to elicit trauma-relevant material. The client is told "Blank out (or "Let go of") the material, take a deep breath. What do you get now?" These instructions appear to allow the client to self-dose the exposure, attain a sense of mastery over the disturbing target, and finally reaccess the material without interrupting the arousal and state-dependent processing that are assumed to be taking place. The deep breath serves as a distraction that momentarily separates clients from their disturbance and thereby allows them to verbalize the experience. They are not, however, told to "relax" or given any other instruction that might alter the state-dependent information, since their designated goal is to focus directly on the information as it is *currently* stored. The client's response at the end of each set of stimuli determines the manner in which the clinician directs his/her subsequent focus of attention and may entail a change in the length, speed, and even type of stimulation used. The interactive administration of each individual set of stimulation is then guided by the client's verbal and nonverbal responses (Shapiro, 1995).

The patterns of memory processing and generalization effects revealed by clinical observations of EMDR treatments have been systematized procedurally to guide clinical practice (Shapiro, 1995; Shapiro & Forrest, 1997). The clinician is guided by rules of intervention that allow for maximum client feedback and direction, along with a consistent level of change from one set of stimulation (i.e., eye movements, taps or tones) to another. If no processing is evident from one set of stimulation to the other, numerous variations of movement and specific procedural instructions are available to help get things moving again (Shapiro, 1995). It is important to note that processing is not assessed midsession by SUD level, but rather by the types of changes in the client's reported images, thoughts, sounds, and/or sensations. In fact, to minimize demand characteristics, and because it is not needed to assess the ongoing changes, a SUD level is generally not taken until the client is evincing no disturbance in response to the accessed material and there is no evidence of further processing. At that point, the client will generally reveal a 0–1 SUD level, which is the signal to the clinician that the installation phase can now commence. Quantitative as well as qualitative assessments are recommended, as it is important that the positive cognition not be introduced prematurely (Shapiro, 1995).

Phase Five is called *Installation* because its focus is on incorporating and increasing the strength of the positive cognition designated to replace the original negative self-belief. During the *Desensitization* phase it is not unusual for a more therapeutically beneficial positive belief to arise than the one that had been identified in the preceding *Assessment* phase. Regardless of its origin, the most enhancing positive cognition is elicited and paired with the previously dysfunctional material during the sets of stimulation until a VOC of 7, or evidence of ecological validity (assessed in relation to the client's current social groups), is achieved. Only at this point is the next phase introduced.

In the *Body Scan* phase, Phase Six, the client accesses both the targeted event and the identified positive cognition and by so doing reveals his/her current level of physiological and/or affective disturbance, if any. He/she notes any residual tension that is being experienced in the form of body sensations and any such persisting somatic responses are then targeted by the clinician for further reprocessing. During this phase, it is often found, on the basis of additional client associations, that these body sensations afford access to ancillary dysfunctional traumata that must then be processed. Therapeutic treatment is not considered complete as long as there remain any physical tensions or other sensations signifying the presence of other disturbances. The *Closure* Phase (Seven) is considered necessary in order to enhance the client's sense of self-mastery, since it is clinically desirable for him/her to be brought back to a state of equilibrium at the end of each session, even if reprocessing is not yet complete. A variety of self-control techniques, which were taught during *Preparation*, may be used. In addition, clients are debriefed on their processing experience and told what to expect and what to do between sessions. These instructions include how to maintain a journal and to record any disturbance that arises. The form that this journal takes parallels the assessment stage of treatment and, therefore, facilitates the process of accessing appropriate targets in future sessions. Further, the clients' acts of recording and recognizing patterns of reaction appear to encourage a sense of self-mastery and observation during subsequent *in vivo* exposure to real-life disturbing conditions. The self-control techniques are used by the client to reattain a state of emotional comfort once recording has been completed. These activities facilitate between-session stabilization.

The *Reevaluation* treatment phase (Phase Eight) includes additional target elicitation, as well as the review necessary to ensure optimal treatment effects. The clinician reviews the client's journal to identify appropriate targets and assesses the degree to which treatment effects have persisted. Also during this phase, the clinician guides the client through the various EMDR protocols and the full treatment plan. Successful treatment can only be determined after sufficient reevaluation of reprocessing and behavioral changes. The goal of EMDR therapy is to produce the most substantial treatment effects possible in the shortest period of time, while simultaneously maintaining client stability

(i.e., preventing emotional overload) while maintaining a balanced system (e.g., appropriately integrated with his/her larger family and social systems). Therefore, it is essential that behavioral feedback is evaluated over time. The eight phases of treatment may be completed in a few sessions, or over a period of months, depending upon the needs of the client and/or the seriousness of the pathology.

## ADDITIONAL AREAS OF POTENTIAL STUDY

In addition to the procedural components mentioned thus far, which are themselves relevant areas of study, the following elements should also be duly assessed. However, only a brief review of potential contributions can be made, and there are no assumptions of primacy or conjectures regarding relative weighting of the various factors.

### *Eye Movement (and Alternative Stimulation)*

As stated in numerous articles (e.g., Shapiro, 1989a, 1989b, 1991a, 1994), the use of eye movements in EMDR was based upon an accidental discovery of their apparent ability to defuse negative emotions and cognitions, rather than the logical outcome of a theoretical position. A subsequent examination of the literature, however, revealed that this was not the first time such a role for oculomotor behavior had been observed. Many years earlier, Antrobus and his colleagues (e.g., Antrobus, 1973; Antrobus, Antrobus, & Singer, 1964) had demonstrated in systematic experiments that spontaneous eye movements are associated with unpleasant emotions and cognitive changes. In their studies, they noted that characteristics of eye movements appeared to correspond significantly with certain cognitive responses (Antrobus, 1973; Antrobus et al., 1964). They reported, for instance, that "the attempt to break up a thought sequence when it is unpleasant or anxiety provoking may very well lead to a series of almost desperate rapid shifts in cognitive activity with consequent ocular motility" (Antrobus et al., 1964, p. 251). In the course of the experiment, Antrobus reported questioning a subject on the nature of his/her cognitive content after observing a series of saccades during a 1.5-second interval and was informed that the eye movements had followed a highly unpleasant thought. He speculated that the series of saccades was associated with an automatic attempt at thought dispersal. Shapiro (1989a,b) made a similar observation, first on the basis of her own experience, and then by deliberately experimenting with others by means of induced saccades of approximately equivalent speed to those noticed by Antrobus and colleagues. Thus, Shapiro's finding that inhibition of unpleasant thoughts and shifts in cognitive content are associated with spontaneous multiple saccades suggests that she had simply rediscovered a phenomenon that had already been documented in the laboratory.

The only study purporting to test the effects of eye movement in a component analysis of the original "EMD" technique (Shapiro, 1989a) with a diagnosed PTSD population was by Montgomery and Ayllon (1994), who tried to determine whether the addition of eye movements to exposure and cognitive restructuring was necessary for treatment gains. In their words, "The data indicate that with PTSD subjects the use of short duration repeated exposure and cognitive restructuring alone were insufficient for positive treatment gain." However, the addition of the eye movements in five of six subjects "resulted in the significant decreases in self-reports of distress previously addressed. These findings are reflected by decreases in psycho-physiological arousal" (Montgomery & Ayllon, 1994, p. 228). Further, in the only published controlled component process analysis of the more clinically refined and complex EMDR method using single-trauma PTSD victims, D. Wilson, Silver, Covi, and Foster (1996) identified, by means of biofeedback equipment, what they referred to as a "compelled relaxation response" during the eye movement condition (supporting a conditioning model via the parasympathetic system). No such response was observed in the exposure condition, or with a motor activity control (which the authors pointed out may have been too complex and therefore "interfered with the relaxation responses," p. 227). It is important to note that besides eye movements, which may be either rapid (saccadic) or slower (tracking), other kinds of stimulation (e.g., rhythmic, bilateral handtaps, and audiotones) with EMDR have also been shown to have clinical utility (Shapiro, 1991b, 1994, 1995). It is of interest, therefore, to find the common denominator among these various kinds of clinically effective stimuli. A recent series of controlled studies (Andrade, Kavanagh, & Baddeley, 1997) evaluated the effects of a variety of tasks (articulation, tapping, and eye movements) employed during mental imaging. The specific goal of this research was to test the hypothesis that the "eye-movements reduce the vividness of distressing images by disrupting the function of the visuospatial sketchpad (VSSP) of working memory, and that by doing so they reduce the intensity of the emotion associated with the image [and that other] visuospatial tasks may also be of therapeutic value" (Andrade et al., 1997, p. 209). Their hypothesis was supported for recollections of personal memories, indicating the presence of a direct physiological effect of the dual stimulation, which lessened both the vividness of the disturbing image and the attendant emotional distress. However, the various dual attention tasks used by these investigators appear to have been of differential efficacy since (a) an articulation task had no effect, (b) a complex tactile stimulation, rather than a simple one, was needed to match the eye movement effects, and (c) in autobiographical emotive-related imagery the eye movement condition was superior to the tapping condition.

Further study is needed to identify the best stimulation to use in the clinical application of EMDR and the underlying basis for its effectiveness. Regardless of any presumed physiological correlate (e.g., Andrade et al., 1997, D.

Wilson et al., 1996), it would be useful to determine by controlled studies if or to what extent focused attention on *any* nonemotional task allows the client to maintain an awareness of present safety while simultaneously reexperiencing the earlier traumatic material and perhaps increasing their sense of self-mastery. Further, it is possible that the client's coparticipation with the therapist in a cooperative task of focused attention serves to titrate the exposure experience and help prevent avoidance behavior. In this context, it is important to note that both clients and clinicians have reported a personal preference for eye movements or eye fixation and tapping over simple exposure (Boudewyns & Hyer, 1996; Lipke, 1994; Pitman et al., 1996). Alternatively, it may be that the inclusion of *any* nonemotive evoking task (along with the other procedural elements of EMDR) activates the presumed information processing system and, therefore, has a salutary effect when linked to the targeted disturbing information (Shapiro, 1995). For further discussion see *Component Analyses* section below.

### *Exposure*

Exposure, whether viewed as an underlying process or simply an operational component of treatment, is ubiquitous to all psychotherapies. Thus, it is difficult to imagine therapeutic change occurring without requiring the client to focus some attention on the presenting problem. Further, since EMDR integrates a large number of traditional procedural elements into its protocols, it is not surprising that exposure (which is assumed to be a primary element of flooding and other behavioral treatments) is included. However, according to present theories guiding the use of exposure therapies, the presence of exposure alone cannot entirely account for the EMDR effects. In fact, if anything, exposure appears to be used in a *contraindicated* fashion in EMDR (see Boudewyns & Hyer, 1996; Rogers et al., 1999 [this issue]; Shapiro, 1995; Shapiro & Forrest, 1997), a point that will be clarified below. Therefore, the role of exposure in EMDR should be closely examined.

With EMDR, the client is prepared and instructed to remain in contact with the disturbing imaginal experience for brief, interrupted periods of time. The fact that EMDR produces beneficial effects using short doses of exposure (e.g., Marcus et al., 1997; Rothbaum, 1997) must be reconciled with the fact that the same regimen when used in the context of systematic desensitization (using a conditioning model) fails to produce rapid attenuation of disturbance at the high end of the anxiety continuum (Wolpe, 1958). In investigating the form of exposure used in EMDR, it is also important to address the apparently discrepant finding that EMDR generally results in an immediate decline of disturbance, while with flooding a minimum of 25 minutes of continuous exposure is usually required to produce a significant decrease in distress during an

individual session (Chaplin & Levine, 1981; Foa & Kozak, 1986). Furthermore, in contrast to EMDR, prolonged (rather than brief) exposure is considered to be the most effective form of treatment for techniques based upon an extinction/habituation model (Chaplin & Levine, 1981; Foa, Steketee, & Rothbaum, 1989; Lyons & Scotti, 1995; Marks, 1972). As noted by Marks et al. (1998), "In vertebrates and invertebrates, exposure gradually reduces defensive responses to cues to which the subject is exposed; this habituation depends on the dose of exposure. Continuous stimulation in neurons and immune and endocrine cells tends to dampen responses, and intermittent stimulation tends to increase them" (p. 324). According to this criterion, EMDR's intermittent exposure to the traumatic cue should sensitize, rather than desensitize, the client.

In addition, the extinction/habituation model upon which exposure therapies are predicated (e.g., utilizing 14–50 hours of exposure in combined treatment sessions and intervening homework assignments) does not appear to account for the extreme rapidity with which substantial EMDR effects are obtained (i.e., the remission of symptoms within three sessions; Marcus et al., 1997; Rothbaum, 1997; Scheck et al., 1998; D. Wilson et al., 1996; S. A. Wilson et al., 1995, 1997). Unlike flooding, EMDR consists of a dosed, sequentially applied exposure, with only a relatively small amount of clients' attention directed at the most unpleasant part of the memory and no deliberate exacerbation of their distress by concentrating on the details of the traumatic experience (Shapiro & Forrest, 1997 for transcripts of treatment sessions). The achievement of positive therapeutic effects under these conditions should be investigated, either to amend the current extinction/habituation model or to identify a different paradigm by which to explain the therapeutic success of EMDR. Such a study is particularly important, given the observation by behavioral researchers that: "In strict exposure therapy the use of many of ['a host of EMDR-essential treatment components'] is considered contrary to theory. Previous information also found that therapists and patients prefer this procedure over the more direct exposure procedure" (Boudewyns & Hyer, 1996, p. 192; Pitman et al., 1996)

Another important deviation from traditional exposure practice is the manner in which traumata are targeted. At the conclusion of each set of eye movements with EMDR, clients are asked, "What do you get now?," a request that tends to automatically bring new pieces of information to the client's mind. These items are sequentially targeted in the order of their appearance, a procedure that (based on the rapidly obtained EMDR treatment effects) may be much more effective in accessing the most relevant distressing material than is that used in either systematic desensitization or direct therapeutic exposure in which the client is repeatedly drawn back to the initial traumatic image. Further, the therapist's instructions to "just notice" the trauma and its attendant disturbance (rather than to try to change it or defend against

it) may serve to increase the counterconditioning and exposure benefits of EMDR by reducing the client's "fear of the fear," an inclination that must certainly contribute to his/her ongoing distress and, in any event, is inimical to positive treatment effects. As previously noted, this interference may be facilitated by the eye movements (or other bilateral stimuli used in EMDR). However, the effective ingredient here does not seem to be "distraction," since a number of studies have indicated that distraction lessens, rather than increases, long-term therapeutic effectiveness (Grayson, Foa, & Steketee, 1982, 1986; Sartory, Rachman, & Grey, 1982). Thus far, three controlled studies directly comparing EMDR and traditional exposure therapies have found EMDR to be the more efficient (Freund & Ironson, 1998; Lee & Gavriel, 1998; Vaughan, Armstrong, Gold, O'Connor, Jenneke, & Tarrier, 1994).

### *Synchronization of Memory Components*

During the assessment phase of treatment, the primary aspects of the trauma are identified and maintained in consciousness. Specifically, the client is asked to hold in mind, simultaneously, a representative image of the event, the negative belief associated with the event, and the attendant physical sensations. This systematized alignment or synchronization of pertinent aspects of the target appears to assist in accessing the dysfunctional information, a potentially important factor in information processing (Allen & Lewis, 1996; Foa & Kozak, 1986; Sweet, 1995). It is assumed that these state-dependent memories (discussed in previous section) are then associated with emotionally corrective information by means of the positive cognition. This therapeutic alignment, or synchronization, of target components (including image, belief, physical sensation, etc.) in EMDR appears compatible with the BASK (behavioral, affect, sensation, and knowledge) model of dissociation propounded by Braun (1988; see also van der Kolk, 1994). It has been conjectured that insufficiently processed traumatic memory is stored in fragments. Therefore, it is possible that the EMDR procedures serve to forge the appropriate connections among the various bits of traumatic material, assists the client to understand the experience, and finally facilitates the storage of the information in narrative (or explicit) memory (van der Kolk, 1994; van der Kolk et al., 1996). In turn, this processing appears to facilitate the creation of the narrative context, which has been viewed as an essential element in the elimination of PTSD symptomatology (Meichenbaum & Fitzpatrick, 1993).

### *Guided Imagery and Perceived Mastery*

Using EMDR to assist clients to create and discard their traumatic imagery repeatedly and at will may provide them with a sense of mastery as a result of

this newfound ability to mentally delimit and control disturbing internal stimuli. In addition, the act of focusing on these stimuli for brief intervals while simultaneously receiving supportive statements from the clinician in what is obviously a safe context may help to foster positive counterconditioning. This therapeutic context may also help to provide the benefits of repeated exposure in a manner that allows sufficient (albeit shorter than generally suggested) doses to counter the avoidance reaction that accompanies and maintains the pathology (Keane, Caddell, Martin, Zimering, & Bender, 1985; Mowrer, 1960). Further, as previously mentioned, many of the procedural elements, as discussed in preceding sections, are deliberately included in order to encourage a sense of mastery and stability while active processing is inaugurated (Hyer & Brandsma, 1997).

*Cognitive Perspective*

With EMDR, clients are encouraged to concentrate for prescribed periods of time on the physical sensations associated with their traumatic imagery. This focus may allow them to identify the purely sensory effects (e.g., physical pain) of the trauma and to separate them from the cognitively laden affective *interpretations* (e.g., I am helpless) of these sensations. Without this latter capacity, they may overidentify with the labeled emotion, as typified in the statement, "I am afraid," or "I am angry," which semantically equates "I" with "fear" or "anger". By observing their reaction to the target, clients may come to realize that they exist independently of both their pathological cognition and condition.[1]

Another important aspect of cognitive perspective occurs in the assessment phase, when the client identifies both a negative and a positive cognition. Clients who have been helped to identify their negative self-assessments of their trauma may be better able to perceive the irrationality of these cognitions. Furthermore, the acts of restructuring and reframing that accompany the formulation of positive cognitions may expedite therapy. As part of established EMDR protocols, a "cognitive interweave" is used when change is not demonstrated in consecutive sets of stimulation. A "cognitive interweave" entails the incorporation into the basic EMDR procedure of a variety of strategies,

[1] On a very hypothetical level, one potential reason this is achieved is through the shifting of focus from their nebulous feelings of overwhelming fear to the concrete bodily concomitants (e.g., sensations in the stomach) of this fear. Success in this "cognitive separation" may allow clients to recognize the changeability of the sensations (e.g., the transmutation from a sensation in the stomach, to the sensation in the chest) which, in turn, can increase their self-awareness and perceived self-efficacy. In addition, these short periods of attention to bodily sensations may provide the same benefits of counterconditioning and exposure as do the previously described alternating creation and dismissal of traumatic imagery.

including aspects of Socratic questioning, guided imagery, metaphor, elicitation of information, etc. and is timed in such a manner as to mimic spontaneous client information acquisition and processing (Shapiro, 1995). The "cognitive interweave" is recommended when the client (a) continues to experience a high level of disturbance with repetitive negative thoughts, affect, or imagery, (b) has insufficient information to progress cognitively or behaviorally, (c) has shown a deficit in generalization of positive treatment effects, and/or (d) when time pressures demand more rapid therapeutic progress in order to increase client satisfaction and subsequent treatment compliance.

## CLINICAL AND RESEARCH PROTOCOLS

The generic therapeutic protocol underlying comprehensive EMDR treatment includes a "three-pronged" approach subsequent to appropriate therapeutic stabilization and client preparation. Specifically, the client is engaged in: (a) processing of experiences contributing to the dysfunction, (b) processing triggers that elicit present disturbance, and (c) incorporating imaginal templates of positive/useful skills and behaviors for future adaptive actions. For each of the various clinical complaints (phobias, PTSD, etc.), variations of procedure and the use of specific targets for processing are suggested to the therapist. For instance, for single-event traumata, it is suggested that the therapist target the memory or image of the actual event, along with any flashback scene, dream image, or specific stimuli that are accessible by the client. It is recommended to clinicians that to address their clients' avoidance behaviors they should have them imagine engaging in previously avoided situations during EMDR processing while simultaneously utilizing a variety of new behaviors while feeling comfortable and in control (Shapiro, 1995).

The successful treatment of PTSD of multiple-trauma victims, such as combat veterans and repeated molestation victims, usually requires longer treatment time than is the case for single-trauma clients, since many of various traumata must be targeted separately (Carlson et al., 1998; Lipke, 1999; Marcus et al., 1997; Shapiro, 1995; Shapiro & Forrest, 1997). An examination of the studies in which EMDR was used with multiply traumatized combat veterans indicates that, like any other method, it is important that EMDR adhere to the clinically relevant standards for this population. Not surprisingly, those studies characterized by an insufficient number of sessions (e.g., 1–2) for treating multiply traumatized combat veterans and/or those that address only one or two traumatic memories out of many (i.e., Boudewyns & Hyer, 1996; Boudewyns et al., 1993; Devilly, Spence, & Rapee, 1998; Jensen, 1994; Pitman et al., 1996) obtained negligible or modest effects. In contrast, the one published study with consistent procedural fidelity (Carlson et al., 1998) and an appropriate number of sessions (12) for this clinical population (see Shapiro, 1995, 1996a, 1998) found EMDR treatment to be very effective. Specifically,

Carlson et al. (1998) found that 75% of their EMDR subjects were no longer diagnosed with PTSD at a 9-month follow-up session. This effect greatly exceeds that found for any other method tested in controlled studies of combat veterans (e.g., Boudewyns & Hyer, 1990; Cooper & Clum, 1989; Keane, Fairbank, Cadell, & Zimering, 1989) and directly contradicts the belief that chronic PTSD is not amenable to treatment (Shalev, Bonne, & Eth, 1996).

The eight-phase EMDR treatment tailors its protocols to meet the needs of the specific client. For example, a standardized protocol was developed in 1990 specifically for the treatment of phobias (Shapiro, 1990). However, while clinical observations have supported the use of this phobia protocol (e.g., Fensterheim, 1996; Lipke, 1994; Marquis, 1991), experimental results have been more equivocal. One of the reasons for this contradictory outcome may be that the phobia protocol that has been used in research is not the one used in clinical practice (Shapiro, 1995). Furthermore, those procedural elements of the clinical protocol that have been used have often been misapplied. Thus, the protocols have been truncated in order to conduct component analyses (e.g., Lohr, Tolin, & Kleinknecht, 1995, 1996; Sanderson & Carpenter, 1992), procedural elements, such as free association, have been eliminated (e.g., Acierno, Tremont, Last, & Montgomery, 1994; Bates, McGlynn, Montgomery, & Mattke, 1996; Sanderson & Carpenter, 1992), and (even when otherwise specified by the researchers) procedures have been carried out improperly and protocol targets eliminated (e.g., Bates et al., 1996; Kleinknecht, 1993; Muris & Merckelbach, 1995, 1997; Muris, Merckelbach, Van Haaften, & Mayer, 1997; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998). Table 1, which lists all of the phobia studies of which the author is aware, illustrates the common deficits in procedural and protocol adherence. Indicated in the first column of this table is a fidelity rating of EMDR procedure utilization (as described in Shapiro, 1995). Two doctoral-level clinical psychologists served as blind evaluators. Their expertise in EMDR had previously been assessed and verified, and they received copies of only the procedure sections of the English language studies (translations to blindly assess fidelity were not available for those published in the Netherlands) and were asked to rate the fidelity of treatment on a 0–10 scale. Each evaluator had accumulated approximately 25 years of general clinical experience and 7 years of EMDR experience (including 5 years as an EMDR instructor). For each of the EMDR utilizations they designated a fidelity number based upon the degree to which its components and procedures (see discussion below) were appropriately used. The remaining columns of Table 1 indicate the phobia protocol steps that were employed in each study and their results. Those studies that used 5 or more of the 11 standardized phobia protocol steps resulted in a complete elimination of the presenting complaint, those that used less than five produced only partial remissions, and those that used none of the steps achieved no effect at all. A short discussion will attempt to illustrate the various problems of procedural implementation identified in these articles.

While the consequences that failing to adhere to the defined steps of the phobia protocols have on treatment success are obvious from Table 1, it is not always easy for readers unfamiliar with the EMDR process to determine from reading the research paper if a given study has or has not complied with them, or whether the procedural elements were faithfully executed. However, review of a recent set of studies (Muris & Merckelbach, 1995, 1997; Muris et al., 1997, 1998) should clarify this matter. In these studies, the issue of whether or not procedural fidelity had been achieved was a source of debate because some positive effects were actually achieved.[2] Specifically, self-reports of fear were reduced according to the SUD Scale and were validated on other standardized measures as well. Furthermore, a variable increase of steps was achieved on a Behavior Avoidance Test. Nevertheless, a careful examination of these studies reveals them to be substandard in a variety of ways. The first of these flaws is the failure to use appropriate positive cognitions. For example, the statement, "I am someone who is able to control a spider" should not have been used because it is not ecologically valid. That is, in real life an individual cannot typically control a spider's actions. Other deficiencies include (a) using an inaccurate order and incomplete delineation of assessment components; (b) describing, rather than specifying the location of, the delineated physical sensation (see previous discussion and Shapiro, 1995); (c) giving instruction to "relax" between sets (except in the latest study, Muris et al., 1998); (d) failing to introduce procedural variations, including the cognitive interweave, to reduce the SUD level or increase the validity of the positive cognition (e.g., note that the reported mean SUD level is well above the 1–2 needed for the *Installation* phase; Shapiro, 1995); (e) introducing the positive cognition prematurely; and (f) failing to incorporate the *Preparation, Body Scan*, *Closure* , or *Reevaluation* phases into the procedure. In addition to these procedural problems, only 3 (or less) of the 11 phobia protocol steps were used (see Table 1).

The researchers' finding that *in vivo* exposure is superior to some of the imaginal aspects of the EMDR protocol is unsurprising given the treatment restraints and undoubted superiority of live exposure and modeling for this population (De Jongh, Ten Broeke, & Renssen, 1999 [this issue]). However, in order to provide a more objective comparison, care should be taken in future tests of EMDR to incorporate the steps specifically designed to eliminate anticipatory anxiety and avoidance behavior (Steps 8–11; Shapiro, 1995). It is recommended that the anticipatory anxiety and avoidance behavior measured in the Behavioral Avoidance Test be addressed by means of the template for future action and the frame-by-frame "videotape," which are incorporated

[2] Similar claims based upon SUD reduction have been made by researchers of other studies with even less adherence to procedural and protocol fidelity (e.g., Bates et al., 1996; Sanderson, & Carpenter, 1992).

TABLE 1

PROCEDURAL AND PROTOCOL FIDELITY TO STANDARD EYE MOVEMENT DESENSITIZATION AND REPROCESSING (EMDR) TREATMENT OF PHOBIAS

| Investigator | F | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Results |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acierno et al., 1994 | 2 | | | | | | | | | | | | x | None |
| Bates et al., 1996 | 2 | | | | | | | | | | | | x | None |
| De Jongh & Ten Broeke, 1993 | | | x | x | x | x | x | x | x | x | | | | Largely eliminated |
| De Jongh & Ten Broeke, 1994 | | | x | x | x | x | x | x | x | x | x | | | Elimination |
| De Jongh & Ten Broeke, 1996 | | | x | x | x | x | x | x | x | x | x | | | Elimination |
| De Jongh & Ten Broeke, in press | 8 | | x | x | x | x | x | x | x | x | x | | | Elimination |
| Kleinknecht, 1993 | 3 | | | | | | x | x | x | x | x | x | | Elimination |
| Lohr, Tolin, & Kleinknecht, 1995[a] | | | | | | | | | | | | | | |
| S-1 | 3 | | | x | | x | | | | | | | | Initial remission with behavioral |
| S-2 | | | | | x | x | | | | | | | | relapse |
| Lohr et al., 1996[a] | | | | | | | | | | | | | | |
| S-1 | 5 | | | x | x | | | | | | | | | Partial |
| S-2 | | | | x | | x | | | | | | | | elimination |
| Muris & De Jongh, 1996 | | | | | x | x | | | x | | | | | Standardized fear reduction/+BAT |
| Muris & Merckelbach, 1995 | 6 | | | | x | x | | | x | | | | | Standardized fear reduction/+BAT |
| Muris & Merckelbach, 1997 | 4 | | | | x | x[a] | | | x[a] | | | | | Self-report fear reduction/minor +BAT |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Muris et al., 1997 | 5 | | x | x[b] | | | x[b] | | | Standardized fear reduction/minor +BAT |
| Muris et al., 1998 | 4 | | x | x | | | x | | | Self-report fear reduction/minor +BAT |
| Sanderson & Carpenter, 1992 | 0 | | | | | | | | x | None |
| Ten Broeke & De Jongh, 1993 | | | x | x | x | x | x | | | Elimination |

F = Procedural fidelity blindly assessed on scale of 0 to 10 (not available for articles written in Dutch).

1–11 = (components of standard EMDR/phobia protocol): 1 = therapist provided specific EMDR education and instruction in self-control techniques; 2 = therapist extracted and processed the ancillary events that contribute to phobia; 3 = therapist extracted and processed the first time fear was experienced; 4 = therapist extracted and processed the patient's most disturbing experience; 5 = therapist extracted and processed the most recent time fear was experienced; 6 = therapist extracted and processed any associated present stimuli; 7 = therapist directed client to process physical sensations or other manifestations of fear, including hyperventilation; 8 = therapist helped client to incorporate a detailed template for fear-free future action; 9 = therapist and client arranged contract for *in vivo* action; 10 = client runs mental videotape for full sequence of *in vivo* action and reprocesses disturbance; 11 = clinician uses journal report to complete processing of targets revealed between sessions.

12 = outside standard protocol—only undifferentiated "fearful image" targeted.

Results = elimination of phobic behavior reported *in vivo* (and in session measures); fear reduction demonstrated in session on standardized measures; fear reduction demonstrated in session through self-report; fear reduction demonstrated through BAT (Behavioral Avoidance Test); + = increase in number of steps achieved.

[a] $N = 2$. Each subject (S-1, S-2) received only two (different) protocol steps.

[b] Designated targets were not treated in all subjects in the experiment during the single 1–1.5-hour treatment session.

into the EMDR protocols but were not utilized by these researchers (De Jongh et al., 1999 [this issue]). Further, as with all clinical research, it is strongly suggested that fidelity checks by qualified evaluators be incorporated to ensure an adequate test of the method under evaluation (Beutler, Machado, & Neufeldt, 1994; Elkin, 1994).

## DISCUSSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

### *Phobias*

As seen in Table 1, a review of the research on phobias indicates only sporadic adherence to the standardized EMDR protocols that have been constructed for this population on the basis of much clinical observation. As previously noted, however, certain patterns of memory storage and association have been described and standardized in order to guide clinical practice (Shapiro, 1995). For instance, it has often been found that addressing a specific memory of a phobic response can stimulate memories of earlier events that may have laid the groundwork for the pathology (Shapiro, 1995; Goldstein & Feske, 1994; Lohr, Tolin, & Kleinknecht, 1995). The lack of suitable processing of these ancillary events can contribute to relapse, just as can the lack of preparation for future confrontations (Lohr, Tolin, & Kleinknecht, 1995). In other instances, however, the processing of stimuli (e.g., Kleinknecht, 1993) or pivotal events can lead to the spontaneous remission of the pathology (e.g., Lohr et al., 1996). It is recognized that some phobias can be eliminated by merely targeting and processing a pivotal memory of the trauma or fear, and/or of an imagined encounter, while others involve a protocol step in which anticipatory anxiety is attended to directly (Shapiro, 1995). The examination of differential client need and responses will be an important area of interest for future research (Beutler, 1991).

Based upon the observed differences among clients and phobic conditions, the EMDR phobia protocols (Shapiro, 1990, 1995) have been written to address all of the generally observed elements contributing to the phobic response and, when necessary, to lead the client through imaginal encounters with the feared event, along with planned *in vivo* exposure to identify any additional triggers that may exist. The application of the entire protocol is taught to the practicing clinician and has revealed positive effects in reported research (De Jongh & Ten Broeke, 1994, 1996, 1998; De Jongh, Ten Broeke, & Van der Meer, 1995, in press; Ten Broeke & De Jongh, 1993). Therefore, regardless of the utility of any of its individual parts (e.g., Kleinknecht, 1993) or the partial elimination of phobic responses evidenced in a one-session only EMDR application (e.g., Muris & Merkelbach, 1995, 1997; Muris et al., 1997, 1998), it is important to test the entire protocol in future controlled research

(Beutler, 1991). Only after the complete protocol has been adequately tested should component analyses be initiated (Kazdin, 1992). Further, as indicated by a review of the phobia research (see above and De Jongh et al., 1999 [this issue]), there is a strong need for treatment supervision and adequate fidelity checks by recognized clinical experts, as there is for any methodology that is the subject of experimental test (Beutler et al., 1994; Elkin, 1994). Otherwise, there is no guarantee that the method being utilized is actually the method recognized by the originator and advocated for clinical practice, regardless of the subjective fidelity evaluation of the researcher (e.g., Bates et al., 1996; Muris & Merkelbach, 1995, 1997; Muris et al., 1998; Sanderson & Carpenter, 1992; see Lipke, 1991).

*Diverse Clinical Complaints*

Additional research should address the various protocols that have been constructed for the treatment of other presenting complaints (e.g., somatic disorders, obsessive compulsive disorder, panic disorder, addictions, etc.). While reports have supported the efficacy of EMDR for the treatment of panic disorder (Feske & Goldstein, 1997; Goldstein & Feske, 1994; Nadler, 1996; Shapiro & Forrest, 1997) and obsessive-compulsive disorder (Whisman, 1996), additional studies with these populations should be done in which the complete protocol is used. It should be noted that in the report by Whisman (1996), EMDR is utilized within a cognitive behavioral framework. However, the addition of EMDR appears to result in successful treatment without the need for therapist-assisted *in vivo* exposure. Research is currently underway by the originator of this model to evaluate the clinical reports. In the studies of panic disorder (Feske & Goldstein, 1997; Goldstein & Feske, 1994), the clinically suggested EMDR protocol was stripped of its integrative aspects (e.g., the coping skills/self-control techniques taught in the *Preparation* phase) in order to test only the EMDR-specific elements of the approach (A. Goldstein, personal communication). It will be important, therefore, to test the entire integrative EMDR protocol in future research.

With respect to other presenting complaints, the suggested generic protocol underlying EMDR treatment entails: (a) reprocessing earlier experiences that contribute to the pathology, (b) reprocessing the triggers that elicit present disturbance, and (c) incorporating positive templates for appropriate future action. The contribution of earlier experiences to numerous clinical complaints appears to be supported in a recent study of the effects of EMDR on the remission of dysmorphic body disorder after one to three sessions. This outcome revealed a potential link of body dysmorphic disorder to an etiology similar to those identified for the anxiety disorders (Brown, McGoldrick, & Buchanan, 1997). It should be observed that when EMDR is advocated for the

treatment of complex pathologies, such as substance abuse (Shapiro, Vogelmann-Sine, & Sine, 1994) or dissociative disorders (Lazrove & Fine, 1996; Paulsen, 1995), it is only in combination with traditional methods followed by specialists in the field. It is also important to note that at this time no methods have been designated as "well-established empirically validated treatments" for these pathologies (Chambless et al., 1998).

*Component Analyses*

As previously noted, a sufficient number of controlled EMDR outcome studies for the treatment of PTSD have been done by now to turn to an examination of the various components of the procedure as used with this population and, by so doing, determine their relative importance (Kazdin, 1992). Presumably, all clinicians would wish to use the most efficient and streamlined therapeutic procedures. However, any effective method consists of a number of components that presumably interact with each other in ways that are initially unclear. Weighting these various components in order to distinguish those that are significant from those that are not can only be done by means of controlled studies in which the overall treatment effects used in the comparisons are maximized (Kazdin & Bass, 1989). For example, analogue (subclinical) subjects, usually obtained from student populations, who are suffering from a disturbing memory may receive benefits even if only some aspects of a particular therapeutic procedure are used, while this will almost certainly not be the case for subjects diagnosed with PTSD, since this population is considered to be especially resistant to treatment, as well as to the effects of placebo (e.g., Solomon et al., 1992). On the other hand, the large and consistent changes on standard psychometrics that are required to make sensitive discriminations among individual components of a complex method will not be revealed without a sufficiently large number of subjects, sufficient treatment time, and adequate attention to trauma specifications, secondary gains, etc.

As noted previously, in the only component analysis study of diagnosed PTSD subjects (Montgomery & Ayllon, 1994) evaluating the original "EMD" protocol (Shapiro, 1989a), it was necessary to add the eye movements to the presumed components of exposure and cognitive restructuring to produce a positive treatment effect. However, it can be expected that the present procedures of EMDR, because of their inclusion of many clinical refinements not found in the relatively simplistic EMD technique, will have a robust therapeutic effect even in the absence of the eye movement (or alternative stimulation) component. Therefore, it should be underscored that care must be taken to ensure that component analyses of therapeutic procedures as complex as EMDR are not only scientifically rigorous but clinically valid. It may be proposed, therefore, that for the most accurate assessment of the specific effects of each of the various components of a therapeutic procedure for treating

PTSD, noncompensated, singly traumatized, diagnosed PTSD subjects should be used and evaluated by investigators who have demonstrated their ability to adhere to treatment fidelity. Furthermore, it is important that the full procedure be appropriately utilized and the components chosen for analysis be separate and distinct from those of the comparison condition and, of course, should make theoretical sense (Beutler, 1991; Norcross & Rossi, 1994; Shapiro, 1995).

Unfortunately, while a number of studies have undertaken component analyses of EMDR, few have met the preceding criteria. Some component studies have used multiply traumatized combat veterans as subjects and provided insufficient treatment time (e.g., only two sessions) for this particularly troubled clinical population (e.g., Boudewyns, Stwertka, Hyer, Albrecht, & Sperr, 1993; Devilly et al., 1998) and/or treated only one or two memories (e.g., Boudewyns & Hyer, 1996; Pitman et al., 1996). Neither of these conditions can adequately reflect potential positive changes in the global psychometrics used to test the treatment effects with combat veterans (Fairbank & Keane, 1982). Since the realities of research frequently restrict the number of treatment sessions that may be used, the complexity of the multiple traumata and probable secondary gain issues are likely to attenuate the size of the obtained treatment effects, rendering this population inappropriate for making the fine discriminations necessary for useful component analyses.

When attempting to measure the relative importance of the various components of any therapeutic procedure, it is imperative that a sufficient number of research subjects be used to provide the statistical power to detect relatively small treatment effects (Cohen, 1988; Kazdin & Bass, 1989; Rossi, 1990). Although single-trauma victims represent a more suitable population for component analyses than multiple-trauma victims, an inadequate number of subjects has often been used (e.g., 7–9 per condition) to allow for an unambiguous measure of the expected small differences among conditions using standardized measures (e.g., Renfrey & Spates, 1994[3]). Unfortunately, while a component analysis by D. Wilson et al. (1996) identified a "signature physiological response" for the eye movement condition, thereby suggesting a physiological basis for the effect of this component, this study failed to meet many of the standards of good outcome research (e.g., lack of standardized diagnostic measures) and, therefore, requires replication under more rigorous conditions (see Shapiro, 1996a).

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[3] Thus, despite the fact that out of the participants initially diagnosed with PTSD only 13.5% in the combined eye movement conditions still met criteria at the posttest, while 50% in the eye fixation condition maintained this diagnosis, and the investigators termed the eye movement conditions "more efficient" (p. 238) the small sample sizes prevented the apparently large differences from being statistically significant. However, marginally significant ($p < .06$; C. R. Spates, personal communication) effects for rapidity of effect were obtained.

Additional attempted component analyses that failed to find differences between conditions (e.g., Dunn, Schwartz, Hatfield, & Wiegele, 1996; Sanderson & Carpenter, 1992) used subclinical populations, truncated or omitted the standard EMDR protocols from their procedures (Fensterheim, 1996b; Shapiro, 1995, 1998), and did not meet many of the criteria for good outcome research (Feske, 1998; Shapiro, 1995, 1998). While other controlled component analyses have obtained positive effects for the eye movement condition at posttest (e.g., Andrade et al., 1997; Feske & Goldstein, 1997; Gosselin & Matthews, 1995; D. Wilson et al., 1996; see also Lipke, 1999) and single-subject designs have found positive and "distinct" effects of eye movements (e.g., Lohr, Tolin, & Kleinknecht, 1995, 1996; Montgomery & Ayllon, 1994), many of these studies are also plagued by a number of methodological problems (Shapiro, 1995, 1996). Adding to the confusion is the fact that some component analyses (e.g., Bauman & Melnyk, 1994; Pitman et al., 1996) have used as their placebo conditions alternative stimuli that have actually been used by successful practitioners of EMDR for many years as effective substitutes for the eye movements (Shapiro, 1991b, 1994, 1995). Therefore, a failure to find a difference between eye movements and these control stimuli, while interesting, does not imply that the eye movement or other forms of stimulation or alternate attention are irrelevant to the procedure. Thus, the unfortunate but inescapable conclusion from an examination of all of the EMDR component analyses implemented so far is that no unambiguous determination of the weighting of its individual components is yet possible (Feske, 1998). However, as we have seen, it should be noted that the significance of any given component may be differentially weighted depending upon the target population. In regards to the application to PTSD, eliminating all the nonpatient analogue and multiply traumatized combat veteran studies that used fewer than three sessions and/or provided treatment that was inappropriately restricted to one or two memories out of many, only three studies remain with diagnosed PTSD, all of which have generally supported the specificity of eye movements. These studies are (a) Montgomery and Ayllon (1994) and D. Wilson et al. (1996), who clearly documented the positive additive effects of the eye movement and (b) Renfrey and Spates (1994), who used only six/seven subjects per cell at posttest and obtained marginally significant ($p < .06$; C. R. Spates, personal communication) effects for rapidity of therapeutic change compared to eye fixation and concluded that the eye movement conditions were "more efficient" (p. 238). Clearly more clinically and scientifically valid research must be done.

## CONCLUSIONS

Every complex intervention consists of an interaction of numerous components, and clinical and research practices must be guided by the results of studies in which procedural fidelity has been adequately assessed in order to properly judge their individual effects (Beutler et al., 1994; Elkin, 1994). EMDR is

an eight-phase integrated treatment approach and, regardless of the observed efficacy of its individual components or reports of rapid effects in relatively short periods of time, the fully delineated, standardized procedures and protocols (Shapiro, 1995) should be utilized in research evaluations. Only after the EMDR procedure *in its entirety* has been clearly demonstrated by controlled studies to be effective for a particular clinical population is it appropriate to examine and determine the therapeutic significance of its specific components for that population (Kazdin, 1992). However, it should be recognized that the unilateral decision of a given investigator engaged in clinical outcome research to eliminate aspects of published, standardized protocols, or a failure to attain sufficient treatment fidelity in the method tested, does not add to (and indeed detracts from) the scientific knowledge base regarding EMDR or any other clinical procedure. Furthermore, while component analyses obviously entail the manipulation of a particular component, the remaining procedural elements and fidelity constraints must be maintained, along with due consideration of both scientific and clinical validity.

The positive treatment effects of EMDR have been documented in a number of recent rigorous controlled studies (e.g., Marcus et al., 1997; Rothbaum, 1997; Scheck et al., 1998; S. A. Wilson et al., 1995, 1997). It has been found that 84–100% of subjects no longer have PTSD after 4–5 hours of treatment (with only a 0–10% dropout rate). Clearly, then, the correctly applied procedure significantly accelerates the rate of previously reported PTSD treatment effects (e.g., Brom et al., 1989; Foa et al., 1991; Marks et al., 1998; Resick & Schnicke, 1992; Richards et al., 1994). A meta-analysis of PTSD studies found EMDR and behavior therapy to be the most effective treatments overall, with EMDR cited as "more efficient" with equivalent results attained in one third the time (Van Etten & Taylor, 1998). Indeed, this observation has received independent corroboration in three direct comparative controlled studies of EMDR and traditional exposure therapies (Freund & Ironson, 1998; Lee & Gavriel, 1998; Vaughan et al., 1994). Given the reported differential effects, it is clear that an interaction of specific EMDR procedural elements (presumably together with commonly occurring nonspecific treatment factors) is responsible for the results (Hyer & Brandsma, 1997; Shapiro, 1995; Shapiro & Forrest, 1997). More importantly, it is clear that the substantially reduced time required to produce observable therapeutic results with EMDR bring benefit to the client in terms of both reduced suffering and cost, advantages especially appreciated in this age of managed care. Furthermore, the documented three-session EMDR treatment effects with single-trauma PTSD provide an excellent research tool for investigators of the biological and neurophysiological mechanisms that underlie the therapeutic effects of this procedure and of human memory in general (e.g., Levin et al., 1999 [this issue]; van der Kolk et al., 1997; D. Wilson et al., 1996), and for ascertaining the clinical contribution of multiple component factors that may be used to strengthen not only the integrated EMDR treatment approach, but other therapeutic methodologies as well.

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