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The Relationships among Expectancy, Hypnotizability, and Treatment Outcome Associated with Eye Movement Desensitization in the Treatment of Post-Traumatic Stress Disorder

Lisa Kimberly Largo-Marsh

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THE RELATIONSHIPS AMONG EXPECTANCY, HYPNOTIZABILITY, AND TREATMENT OUTCOME ASSOCIATED WITH EYE MOVEMENT DESENSITIZATION IN THE TREATMENT OF POST-TRAUMATIC STRESS DISORDER

by

Lisa Kimberly Largo-Marsh

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Philosophy Department of Psychology

Western Michigan University Kalamazoo, Michigan June 1996
A pre-test, post-test comparison group design was utilized to assess the effectiveness of two interventions on symptoms associated with Post-Traumatic Stress Disorder. Subjects were randomly assigned to one of two treatments: Eye Movement Desensitization and Reprocessing (EMDR) or structured writing sessions. A standardized diagnostic interview was used to screen subjects and provide diagnosis and symptom profile at intake and one-month follow-up. Standardized self-report measures were used to assess treatment outcomes. Repeated measures ANOVA revealed no significant differences between the two treatments. Both treatments were effective in significantly reducing post-traumatic symptoms at post-test and follow-up, although slightly different patterns were evident. EMDR subjects tended to evidence a larger reduction in symptoms immediately after treatment, while subjects assigned to the writing condition evidenced more gradual improvement, which continued between post-test and follow-up periods. Measures of subject expectations regarding treatment effectiveness revealed no statistical correlation to treatment outcome. Similarly, hypnotic susceptibility was found to be unrelated to the effectiveness of either treatment.
ACKNOWLEDGMENTS

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Lisa Kimberly Largo-Marsh
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INTRODUCTION

The Diagnosis of Post-Traumatic Stress Disorder

Although the psychological and behavioral consequences of traumatic experiences, i.e., combat, have long been recognized, Post-Traumatic Stress Disorder (PTSD) was only recently established as a distinct diagnostic entity, first having been defined in the DSM-III in 1980 (American Psychiatric Association, 1980). In the most recent DSM-IV, the criteria for this diagnosis were slightly revised, and the definition of the traumatic event changed to include a larger range of traumatic events, no longer limited to those "outside the range of usual human experience." Unfortunately, the prevalence rate of PTSD may be significantly higher than previously believed, due in part to the level of interpersonal violence in our society. For example, Breslau, Davis, Andreski, and Peterson (1991) found a lifetime prevalence rate for PTSD of 9.2 % among an urban, young adult, population in Detroit, Michigan. Although reports regarding the prevalence of the disorder vary widely (Barlow, 1988), PTSD has become a significant area for clinical research, assessment and intervention.

According to the current DSM-IV, the criteria for PTSD include: (a) the experience of a traumatic event during which the individual is confronted with threatened death or serious injury to self or others and the individual's response is one of intense fear, helplessness or horror; (b) persistent re-experiencing of the event (i. e., intrusive thoughts, recurrent dreams, flashbacks); (c) persistent avoidance of stimuli associated with, or reminiscent of, the traumatic event (i. e., avoidance of associated thoughts, activities and situations, psychogenic amnesia, diminished interest in activities, feelings of detachment, restricted range of affect, and a sense of a
foreshortened future); (d) persistent symptoms of increased arousal (i.e., sleep disturbance, irritability, difficulty concentrating, hypervigilence, exaggerated startle response, physiologic reactivity to stimuli resembling those associated with traumatic event); (e) duration of the disturbance of at least one month; and (f) the disturbance causes clinically significant distress. (American Psychiatric Association, 1994).

Recent research suggests that the symptoms of PTSD may be remarkably similar for individuals exposed to very different traumatic events, including such diverse events as rape, combat, and natural disasters (Solomon, Ferrity, and Muff, 1992). In addition, co-morbidity of PTSD with other disorders such as depression, anxiety disorders, and substance abuse is common (Keane and Wolfe, 1990; Solomon et al., 1992). Other authors have noted similarities between PTSD and personality disorders such as Borderline Personality Disorder, which may also have roots in a traumatic history (Herman, 1992; Van der Kolk, 1987). Although PTSD is most often characterized as an anxiety disorder, frequently dissociative and depressive symptoms are in evidence as well (McFarlane, 1991). Differential diagnosis of PTSD can be difficult, and misdiagnosis of the disorder most frequently occurs with adjustment disorder, atypical psychosis, paranoid schizophrenia, and depressive or dysthymic disorder with psychotic features (MacHovec, 1985). Davidson and Foa (1992) address the controversies regarding a number of these diagnostic issues, including the definition of the stressor, the validity of the diagnosis across stressor groups, the definition of PTSD as an anxiety disorder and the prevalence of co-morbid conditions with the disorder.

Characteristics of Individuals With Post-Traumatic Stress Disorder

The PTSD diagnosis initially may have been applied primarily to combat veterans, but these symptoms have subsequently been identified in a range of civilian
cases, including individuals subjected to traumatic events such as sexual assaults, physical attacks, natural disasters (floods, earthquakes, hurricanes), industrial accidents, exposure to chemical substances, torture, terrorism, and vehicular accidents (Epstein, 1989; Foy, Donahoe, and Carroll, 1987; Murray, 1992; Scrignar, 1988; Spector and Huthwaite, 1993).

The impact of a traumatic event may be measured in terms of symptom severity or in terms of the proportion of exposed individuals developing symptoms, but regardless as to which measure is used, it is the nature of the traumatic event itself which is the best predictor of the severity of subsequent psychopathology (Green, Grace, and Lindy, 1990; Herman, 1992; Shore, Tatum, and Vollmer, 1986). Herman (1992) states that greater exposure to traumatic events results in more substantial psychological harm. Studies of Vietnam veterans have borne out this relationship: Of veterans exposed to heavy combat greater numbers have developed post-traumatic symptoms compared to smaller numbers of veterans exposed to low or moderate combat (Green et al., 1990; Herman, 1992). Likewise, a study by Kilpatrick, Best, Veronen, Amick, Villeponteaux and Ruff (1985) found a positive correlation between the degree to which an individual is directly exposed to violence and a higher incidence of PTSD symptomology. This study surveyed approximately 500 women who had been victims of serious crimes (attempted rape, completed rape, attempted molestation, completed molestation, attempted robbery, completed robbery, and aggravated assault) and found that victims of the most violent crime (completed rape) reported more symptoms characteristic of PTSD ("nervous breakdown," suicidal ideation and attempted suicide).

A number of researchers have investigated the relationship between the characteristics of individuals who develop PTSD symptomology and the nature of the traumatic event these individuals have experienced (Barlow, 1988; Herman, 1992; Van
Individuals meeting diagnostic criteria for PTSD have experienced a traumatic event, but not all individuals experiencing traumatic events develop PTSD symptomology (Barlow, 1988; Herman, 1992; Van der Kolk, 1987). Multiple factors, including individual attributes and characteristics of the traumatic event, interact to contribute to the development of subsequent PTSD symptomology. Van der Kolk (1987) identifies six factors which interact to effect the result of a traumatic experience on a given individual: Severity of the stressor, genetic predisposition and biological reactivity to stress, the developmental phase in which the trauma occurs, social support system, prior traumatization, and pre-existing personality. Siting research evidence of diverse populations, including children exposed to abusive family environments, survivors at sea, Vietnam veterans and rape victims, Herman (1992) identifies personality characteristics of the minority of individuals not developing PTSD symptoms even after exposure to the most extreme traumatic experiences. These exceptional individuals tend to be highly sociable, have a thoughtful and active coping style and believe they are able to control their own destiny, even in the most adverse of conditions.

Conversely, individual characteristics may predispose other individuals to be more susceptible and thereby prone to develop PTSD (Barlow, 1988; Silverman, 1986). According to Barlow (1988), psychological and biological vulnerabilities may play a role in the development of the disorder. A vulnerable individual may be more likely to respond to an event with intense physiological arousal (biological vulnerability), and may be more likely to sustain an aroused and anxious state following the trauma (psychological vulnerability). Following the traumatic event, adequate coping skills and social support may mediate its impact and thereby lesson the severity of the PTSD symptomology, however the lack of such social support or coping skills may contribute further to the symptomology evidenced in an already
susceptible individual (Barlow, 1988; Herman, 1992; Silverman, 1986; Van der Kolk, 1987).

Some authors have noted that, in general, PTSD individuals tend to be more suggestible / hypnotizable than other diagnostic groups (Spiegel and Cardena, 1990; Stutman and Bliss, 1985) and that certain symptoms of PTSD resemble hypnotic phenomenon (Cardena and Spiegai, 1991; Frankel, 1990; Spiegel, 1988; Spiegel, and Cardena, 1991). Stutman and Bliss (1985) evaluated twenty-six male Vietnam veterans for levels of hypnotizability, imagery and PTSD symptomology. They used standardized scales such as the Stanford Hypnotic Susceptibility Scale (Weitzenhoffer and Hilgard, 1959) to assess hypnotizability, and Sheehan's Vividness of Imagery Scale (Sheehan, 1967) to evaluate imagery ability. Two self-report instruments were used as well, to assess PTSD symptoms and co-morbid diagnosis (Stutman and Bliss, 1985). The results demonstrated a correlation between high scores on the suggestibility and imagery scales and PTSD symptomology. Similarly, Spiegel, Hunt and Dondershine (1988) found that patients with PTSD had significantly higher hypnotizability scores than normal controls and patients with other psychiatric diagnoses (schizophrenia, generalized anxiety disorder, and affective disorders). The question remains as to whether good hypnotic ability predisposes one to develop PTSD, given a precipitating traumatic event, or whether exposure to the trauma itself enhances one's hypnotic capability. More research is needed in this area to explore the relationship between these factors more fully.

Spiegel and Cardena (1990) note the similarity between the symptoms of PTSD and hypnotic absorption, dissociative and suggestibility phenomenon. They propose that re-experiencing of the traumatic event is analogous to hypnotic absorption, in that both are characterized by highly focused attention. Numbing of general responsiveness is postulated to parallel dissociative phenomena in hypnosis, in which an individual
may engage in certain behaviors without conscious awareness. Lastly, Spiegel and Cardena (1990) propose that the increased arousal associated with PTSD may be analogous to the suggestibility of hypnotized individuals in being overly sensitive to environmental and social cues.

Treatment Approaches for Post-Traumatic Stress Disorder

The recent inclusion of PTSD as a diagnostic category in the DSM - III (American Psychiatric Association, 1980) may in part be responsible for the limited number of controlled outcome studies regarding treatment efficacy for the various approaches and techniques used to treat PTSD symptomology (Friedman, 1988). Nonetheless the efficacy of pharmacological as well as psychotherapeutic methods have been assessed in treating the symptoms associated with PTSD. Pharmacological treatments are used, based on the assumption that traumatic experiences may lead not only to behavioral or psychological changes, but to neurobiological changes as well (Solomon et al., 1992). Some double-blind, controlled outcome studies have suggested that the use of anti-depressants may be helpful in reducing the severity of some PTSD symptoms (Davidson, Kudler, and Smith, 1990; Frank, Kosten, Giller, and Dan, 1988). Other studies report less efficacious outcomes, suggesting that the effects are limited to existing depressive symptomology and not related to specific post-traumatic symptoms (Reist, Kauffman, and Haier, 1976). Generally psychotherapeutic methods include those based on behavioral strategies, cognitive interventions, crisis intervention, psychodynamic conceptualizations and group treatment approaches. Although the literature suggests that many of these interventions are effective in impacting at least some of the symptoms of PTSD, much regarding the efficacy of these treatments remains unknown.
Pharmacological Treatments

Van der Kolk (1983, 1987a, 1987b) suggests the use of various psychopharmacological agents in the treatment of PTSD, noting that the pharmacological treatment of PTSD may focus on the reduction in the severity of specific associated symptoms such as hyper-reactivity (anxiety, impulsivity, anger outbursts), intrusive recollections (nightmares, flashbacks), sleep difficulties, depression and associated anhedonia. Benzodiazepines such as lorazepam, oxazepam, and clonazepam may be used to modulate strong affect, improve sleep, decrease nightmares and decrease the tendency for traumatized individuals to self-medicate with alcohol (Van der Kolk, 1983, 1987a, 1987b). Problems of habituation and dependence with benzodiazepines require that these drugs be given to the patient in limited quantities, over a fixed period of time, to be used by the patient only when necessary during periods of more acute distress (Van der Kolk, 1983). Autonomic activation associated with fear responses may be impacted through the use of propranolol, although the high doses of propranolol which may be needed to control arousal symptoms may result in short-term memory impairment (Van der Kolk, 1983). Medications such as lithium carbonate and carbamazepine may be used to regulate affect and control explosive outbursts (Van der Kolk, 1983, 1987a, 1987b). MAO inhibitors may reduce depressive symptoms as well as the frequency and severity of nightmares and flashbacks, although in some cases increased abreaction may follow administration of MAO inhibitors (Van der Kolk, 1983). Somnolent drugs may permit individuals to get needed sleep during periods of insomnia (Van der Kolk, 1983, 1987a, 1987b) and tricyclic antidepressants may affect anhedonia and impact insomnia through their sedative characteristics (Van der Kolk, 1983, 1987a, 1987b). Lastly, antipsychotic
agents may be helpful to reduce the intensity and severity of flashbacks during acute episodes (Van der Kolk, 1983).

Medications alone do not constitute complete or comprehensive treatment and psychotherapeutic methods are needed to promote the desired therapeutic effect in treating posttraumatic stress disorder (Friedman, 1988; McFarlane, 1991). Although psychopharmacological agents are helpful in the treatment of PTSD in reducing the severity of many of the characteristic symptoms of anxiety, depression, insomnia, flashbacks, and nightmares, medications have proven ineffective in treating avoidant symptoms of PTSD (Friedman, 1988).

Psychotherapeutic Interventions

Regardless of the theoretical approach or specific techniques employed by the therapist, there are many common elements in psychotherapeutic approaches used to treat PTSD. For example, regardless as to whether psychodynamic or behavior treatment strategies are used, the importance of focusing on the traumatic memories is recognized (McFarlane, 1989). The emotional availability of the therapist is an important variable in effective treatment (Spiegel and Cardena, 1990). Therapist characteristics such as consistency and warmth contribute to treatment effectiveness (McFarlane, 1989). The usefulness of supportive group therapy as an adjunct to individual therapy is also acknowledged by several authors (Graziano, 1992; Herman, 1992; McFarlane, 1989; Scrignar, 1988).

Effective psychotherapeutic treatments of PTSD share several common features. Not surprisingly, it is important to establish a therapeutic alliance, a task which may be complicated by the difficulty many traumatized individuals have trusting others (Everstine and Everstine, 1993; Graziano, 1992; Herman, 1992). In engaging the client in treatment, the therapist educates the client regarding post-traumatic
symptomology, normalizing the individual's reaction to an outrageous event (McFarlane, 1989; Scrignar, 1988). It is important to convey a sense of hope regarding treatment effectiveness, the individual's future, and his / her ability to overcome past events (McFarlane, 1989; Scrignar, 1988). Confronting the trauma is painful, and feelings of loss, shame, guilt and hopelessness may need to be addressed (McFarlane, 1989). In the end, the individual must establish cognitive mastery over the event, placing its meaning in a more functional context (Everstine and Everstine, 1993; Herman, 1992; McFarlane, 1989; Spiegel and Cardena, 1990).

Herman (1992) outlines several stages of the psychotherapeutic treatment process for trauma survivors. She notes similarities between the symptoms of the PTSD diagnosis and those of other diagnoses, in particular borderline personality disorder, somatization disorder and multiple personality disorder. She notes that people given these diagnoses usually have extensive abuse or trauma histories, often dating to early childhood. Herman (1992) suggests these individuals and others, who have been exposed to prolonged and extensive traumatic experience, may be better categorized and diagnosed with "complex post traumatic stress disorder." Predictably, while the steps to recovery of PTSD symptoms may be similar, individuals with extensive trauma and those with singular traumatic experience proceed at variable rates through the recovery process.

Herman (1992) emphasizes the importance of establishing a therapeutic relationship, a difficult task with trauma survivors who may have learned that others can not be trusted. The therapist must maintain appropriate therapeutic boundaries, which may at times be challenging. The therapist must be able to bear witness to the stories survivors have to tell, and do so while maintaining a degree of both empathy and emotional neutrality. The therapist risks "vicarious traumatization" through exposure to the details of traumatic experiences and support provided by peers and
supervisors becomes a necessity in order to maintain the therapist's own mental health and avoid feelings of personal vulnerability, fear, or loss of faith in mankind (Herman, 1992).

Within the context of the therapeutic relationship, Herman outlines three stages which characterize the general progression for the treatment of traumatized individuals. The first stage addresses the need to establish safety. This may involve managing practical issues, such as managing medical needs, stabilizing one's life and daily routines, or locating safe housing. More likely the issue of safety is more complex, and involves mobilizing the personal resources of the victim to be able to maintain safety, whether it be safety from self-harm, high risk behaviors, or a tendency to place oneself at risk of re-victimization. The second stage involves recounting the details of the traumatic event, and understanding the meaning of the event within the context of one's life. Herman (1992) emphasizes the importance of recalling the traumatic event in detail, and addressing the context, fact, emotion and meaning of the event in order to fully process the experience. In addition, part of the process of remembering and recounting the trauma story involves mourning the associated losses. Herman's (1992) last stage of treatment involves the reconnection of the trauma survivor to other survivors (through group process) and to other members of the community at large. In this stage of treatment the individual is able to build relationships with others and look toward the future with more optimism and hope.

**Psychodynamic Treatments**

Traditional treatment for individuals suffering from trauma has utilized psychodynamic conceptualizations and therapies as well as hypnotic techniques, although evaluation regarding the effectiveness of these treatments is difficult due to the scarcity of controlled outcome studies (Steketee and Foa, 1987). Contemporary
psychodynamic treatment of PTSD tends to address the traumatic event, help the client to understand the meaning of this event and place it within the context of his / her view of the self and the social or physical environment (Scrignar, 1988). Emotional responses to the trauma may be viewed within the context of discrepancies between the individual's existing "schemata" (internalized formulations regarding the nature of one's self and / or the external environment) and the reality imposed by the traumatic event itself (Scrignar, 1988).

Although there may not be a wealth of research supporting the effectiveness of these treatments, the effectiveness of psychodynamic psychotherapies have been compared to other treatment approaches in treating post-traumatic symptoms. For example, Brom, Kleber and Defares (1989) investigated treatment outcomes associated with psychodynamic, hypnotherapy, systematic desensitization, and no treatment conditions. They found that all of these treatment approaches were effective in reducing the intrusive and avoidant symptoms of PTSD with the effects being maintained at three-month follow-up.

Hypnosis

Often hypnosis is used to treat PTSD (Evans, 1991; MacHovec, 1985; Spiegel and Cardena, 1990). Hypnosis can be utilized to promote relaxation and the increased suggestibility experienced during hypnosis assists the individual in adopting more functional beliefs and cognitive strategies regarding the traumatic event. In this manner hypnosis may provide an increased sense of mastery over unpleasant sensations, cognitions, and images associated with the memory of the traumatic event (Scrignar, 1988).
**Cognitive Behavioral Treatments**

Behavioral treatment strategies for PTSD may be generally organized into two broader categories: (1) Those aimed at extinguishing classically conditioned responses to stimuli associated with the traumatic event, including exposure techniques such as flooding (implosion) and systematic desensitization, and (2) those techniques aimed at improving management of symptoms and coping skills, including specific interventions such as: Training in stress management, anger management, stress inoculation, relaxation, social skills, controlled breathing, cognitive restructuring, distraction techniques and thought stopping (Fairbank and Brown, 1987; Foa and Rothbaum, 1989; Scrignar, 1988; Steketee and Foa, 1987).

Exposure techniques include flooding (or implosion) procedures as well as systematic desensitization. Both methods are based on behavioral conceptualizations of PTSD that postulate that respondent conditioning occurs during the traumatic event itself and respondent conditioning may be used to ameliorate the effect. Previously neutral stimuli (harmless, incidental sights, sounds and smells) are correlated with the unconditional stimuli involved in the traumatic event and thereby come to evoke characteristic PTSD responses as conditional responses long after the event. The exposure procedure is analogous to a respondent extinction procedure, where prolonged exposure to conditional stimuli in a controlled and safe environment eventually ceases to elicit emotional responding (physiological arousal).

A number of controlled outcome studies have examined the effectiveness of the flooding procedure and found it to be efficacious in reducing some symptoms associated with PTSD (Boudewyns and Hyer, 1990; Cooper and Clum, 1989; Foa, Olasov Rothbaum, Riggs, and Murdock, 1991; Keane, Fairbank, Caddell, and Zimering, 1989). Boudewyns and Hyer (1990) randomly assigned 38 Vietnam combat
veterans to one of two treatment conditions, direct therapeutic exposure (a flooding procedure) or a control group who received individual counseling. Subjects were given ten to twelve treatment sessions. Outcome measures included a standardized instrument measuring the level of adjustment to civilian life and physiological responses. Post-treatment assessment suggested no differences between the two treatment groups, but assessment at three-month follow-up indicated that subjects given the flooding procedure improved more on the adjustment scale than did the control group.

Cooper and Clum (1989) also evaluated the effectiveness of a flooding procedure with Vietnam veterans and their findings were very similar to those reported above. In this study 14 Vietnam veterans were randomly assigned to flooding or control treatment conditions. Post-treatment assessments indicated that nightmares and anxiety were reduced only for those treated with the flooding procedure. Data at three-month follow-up substantiated the superiority of the flooding procedure, as sleep disturbances and state anxiety were reduced for subjects receiving flooding treatment, but scores for those in the control group remained unchanged. Neither group changed on measures of depression.

Further substantiation of the effectiveness of the flooding procedure has been provided by yet another controlled outcome study with Vietnam combat veterans (Keane et al., 1989). In this case 24 subjects were randomly assigned to flooding treatment or wait-list control conditions. At the assessment conducted six months after the conclusion of treatment, improvement in the treatment group included therapeutic changes on measures of depression, anxiety and re-experiencing symptoms. No significant changes were noted in the wait-list control group.

Research evidence also suggests that the flooding procedure may be effective in treating PTSD populations other than the Vietnam veterans. Foa et al. (1991) investigated the effect of various treatments on female rape victims. After attrition,
treatment outcomes were evaluated for forty-five subjects who had been randomly assigned to one of four conditions: Stress inoculation training (considered in more depth in subsequent pages), flooding, standard counseling, and wait-list control. These authors found that all treatments resulted in improvements on measures of anxiety and depression at post-treatment assessment, but that stress inoculation training was best at reducing the avoidant symptoms of PTSD. However, at three-month follow-up the flooding subjects evidenced the greatest improvement on all measures. Foa et al. (1991) explain these somewhat unexpected results, by postulating that the effects of flooding may be maintained better than those obtained through stress inoculation training because its effects do not depend on the individual's continued practice or deliberate use of specific techniques.

Despite the apparent effectiveness of the flooding procedure, there are some caveats for its use. Noted complications include the exacerbation of depressive symptoms, substance abuse or panic disorder (Pitman, Altman, and Greenwald, 1991). Flooding procedures tend to address primarily the PTSD symptoms associated with anxiety, and therefore other emotions commonly experienced by trauma victims (i.e., anger, shame, guilt, and sadness) may remain untreated. For this reason flooding procedures may be best utilized in combination with other pharmacological or psychotherapeutic interventions, and not considered to be a complete or comprehensive treatment (Cooper and Clum, 1989).

Systematic desensitization has been shown to be an effective treatment for the symptoms associated with post-traumatic stress disorder. For example, Peniston (1986) evaluated the effectiveness of a program of relaxation and biofeedback-assisted desensitization as compared to a no treatment control condition. Their findings indicated that the 48 sessions of relaxation and biofeedback-assisted desensitization resulted in reductions in reported nightmares, flashbacks, muscle tension, and
psychiatric readmissions. These benefits were maintained at two-year follow-up assessments.

Another study provides further substantiation for the effectiveness of systematic desensitization in the treatment of post-traumatic symptoms. As previously mentioned, Brom et al. (1989) investigated treatment outcomes associated with psychodynamic, hypnotherapy, systematic desensitization, and no treatment conditions. At post-treatment assessment they found reductions in intrusive and avoidant symptomology as measured on the Impact of Events Scale (IES) (Horowitz, Wilner, and Alvarez, 1979) for all treatment groups, although reductions were least apparent in the psychodynamic group. Assessments at three-month follow-up suggested that all three treatments were equally effective. However, different trends were apparent. Psychodynamic treatment resulted in greater reductions in avoidant symptoms, while hypnotherapy and systematic desensitization resulted in greater reductions in intrusive symptoms (Brom et al., 1989).

Some authors have evaluated the effectiveness of composite treatment approaches. For example, Foa and Rothbaum (1989) evaluated the effectiveness of a composite treatment approach called stress inoculation training (SIT). SIT includes education regarding PTSD, and training in specific coping skills (deep muscle relaxation, breathing control, communication skills and role playing, covert modeling, thought stopping and guided self dialogue). Training anxiety reduction and fear management techniques, in conjunction with the use of exposure-based therapies appears to be effective in reducing symptoms of PTSD, including depressive and anxious symptoms (Foa and Rothbaum, 1989).
Recently, Shapiro (1989a, 1989b) introduced a promising therapeutic technique for the treatment of PTSD she called Eye Movement Desensitization (EMD). Subsequently Shapiro modified the technique outlined in the original (1989a, 1989b) research, giving more emphasis to the cognitive reprocessing component of the intervention. Thereafter she referred to the technique as Eye Movement Desensitization and Reprocessing (EMDR) (Shapiro 1991, 1993). The Eye Movement Desensitization and Reprocessing technique involves several components. First, the subject is asked to identify the traumatic imagery, associated cognitions and desired cognitions regarding the event. Then, while the subject is visualizing the traumatic scene, and concentrating on physical sensations and negative cognitions associated with it, the subject is asked to follow the therapist's fingers as they move back in forth in the field of vision, inducing rhythmic, lateral, saccadic eye movements (Shapiro, 1989a, 1989b, 1991). After approximately 20 - 30 such saccadic eye movements, the subject is asked to "blank it out" and report the thoughts, feelings or imagery which arises. Sets of saccadic eye movements continue until the subject rates anxiety as low, at which time the therapist asks the subject to think about the cognitions associated with the traumatic event while engaging in saccadic eye movements. Sets of saccadic eye movements are continued in this manner until the subject reports that the desired cognition "feels" true.

Shapiro (1989a, 1989b) conducted a systematic study to assess the therapeutic effects of EMDR with 22 victims of trauma (Vietnam veterans and rape / molestation victims). She reported that the technique resulted in (a) a lasting reduction in anxiety, (b) changes in cognitions associated with traumatic memories, and (c) cessation of flashbacks, intrusive thoughts, and sleep disturbances. Using assessment measures that were largely self report, Shapiro (1989a, 1989b, 1991) reported that dramatic
results were achieved after a single session of EMDR. Shapiro (1989a, 1989b) developed and used a seven point likert type scale, called the Validity of Cognitions (VoC) scale, to measure therapeutic changes in cognitions regarding the traumatic event. Changes in reported anxiety level were measured using the Subjective Units of Distress scale (SUDs) originally developed by Wolpe (1990). Using this scale, subjects were asked to report levels of anxiety using an eleven point likert-type scale. Reductions in reported anxiety (SUDs) and reported reduction or elimination of presenting complaints (flashbacks, intrusive thoughts, and sleep disturbances), as well as increased acceptance of positive self-statements concerning the event (VoC) were maintained at one and three month follow-up (Shapiro, 1989a, 1989b).

Shapiro compared EMDR subjects with those in a control group, who spent a comparable period of time recounting the traumatic story to the experimenter, saccadic eye movements were not employed, nor was the imaginal exposure terminated contingent on the lowering of the subject’s verbal reports of distress, as the eye movements were with the other group of subjects. The control group did not demonstrate any change in anxiety, validity of positive cognitions or presenting complaints (Shapiro, 1989a, 1989b). At the conclusion of the placebo treatment session, subjects in the control group received EMDR treatment, therefore no data were available to compare the effects of the two conditions at follow up.

Shapiro’s original study (1989a, 1989b) has been criticized by numerous authors, noting several methodological problems with the original study, and raising a number of issues for further research in this area (Acierno, Hersen, Van-Hasselt, Tremont, and Meuser, 1994; Boudewyns, Stwertka, Hyer, Albrecht, and Sperr, 1993; Herbert and Mueser, 1992; Lohr, Kleinknecht, Conley, Dal Cerro, Schmidt, and Sonntag, 1992; Oswalt, Anderson, Hagstrom, and Berkowitz, 1993). The assessment measurements used by Shapiro (1989a, 1989b) were subjective in nature, comprised of
verbal reports made to Shapiro herself, who functioned as both researcher and author. The characteristics, symptoms and diagnosis of the individuals included in this study lack clear definition and standardized measures were not used to define criteria for subject participation. In addition, reported therapeutic changes were not measured using standardized instruments (Acierno, et al., 1994; Herbert and Mueser, 1992; Lohr, et al., 1992).

Shapiro's (1989a, 1989b) use of subjective and unstandardized outcome measures is problematic and limits the conclusions to be drawn from her findings. Some authors, noting this, suggest future research make use of physiologic measures, standardized instruments with demonstrated psychometric validity, or behavioral measures (Herbert and Mueser, 1992; Lohr, et al., 1992; Oswalt, et al., 1993). Numerous authors suggest that subject variables (i.e., diagnosis, co-morbid diagnosis, sex, age, other mental health treatment, medications) should be more clearly defined so that the efficacy of the EMDR procedure in addressing various symptomologies and psychiatric diagnoses may be more accurately assessed (Herbert and Mueser, 1992; Lohr, et al., 1992; Oswalt, et al., 1993).

Shapiro's (1989a, 1989b) study has been criticized regarding the effect of demand characteristics and expectancy variables, which were largely uncontrolled (Acierno, et al., 1994; Boudewyns et al., 1993; Herbert and Mueser, 1992; Lohr, et al., 1992; Oswalt, et al., 1993). Different procedures were used in terminating the imaginal exposure component in the two treatment conditions. Saccadic eye movements and imaginal exposure were terminated with subjects treated with EMDR contingent on the reduction in reported SUDs ratings, whereas no such contingency existed for subjects in the control condition. Therefore, some authors (Acierno, et al., 1994; Herbert and Mueser, 1992; Metter and Michelson, 1993; Oswalt, et al., 1993) note that the treatment protocol used by Shapiro (1989a, 1989b) was implemented in
such a manner that the procedure continued until the client reported relief from symptoms. Subjects receiving EMDR treatment may have felt pressured to report amelioration of symptoms in order to escape a rather aversive therapy. In fact, subjects in the EMDR condition may have been negatively reinforced, inadvertently, for reporting changes in the desired direction on the SUDs and VoC scales, as the aversive exposure and saccadic eye movements continued until such changes were reported (Acierno, et al., 1994; Metter and Michelson, 1993).

Although Shapiro states that she was neutral regarding her expectation regarding treatment outcome, a number of concerns have been raised. Shapiro (1989a, 1989b) refers to the two conditions as treatment and placebo control, a comparison which itself suggests differential expectations regarding the two conditions. The effect of demand characteristics is further obscured as the implementer of the treatment is also the researcher and developer of the procedure (Acierno, et al., 1994). As such she may have subtly and unintentionally communicated her expectations regarding the differential treatment effectiveness of the procedures to the subjects. Heart rate was measured during the EMDR procedure but not during the control condition, another manner in which differential expectations regarding treatment outcome may have been unintentionally communicated to subjects.

**EMDR - Case Studies**

Following Shapiro's (1989a, 1989b, 1991) research suggesting that EMDR had dramatic effects on the treatment of traumatic memories, a number of studies have appeared in the literature. Initially the findings consisted mainly of case studies, which tended to support the efficacy of EMDR (Kleinknecht and Morgan, 1992; Lipke and Botkin, 1992; McCann, 1992; Puk, 1991; Wolpe and Abrams, 1991). However, these results must be interpreted cautiously because the early case studies did not
systematically define the psychopathology being treated, nor control for demand and expectancy variables (the authors were also the treatment providers), and the reported outcomes were based on non-standardized, self report measures (Lipke and Botkin, 1992; McCann, 1992; Puk, 1991; Wolpe and Abrams, 1991). Although these earlier case studies had many of the methodological problems inherent in Shapiro's (1989a, 1989b) original research, they played an important role in supporting Shapiro's findings, and suggesting that the EMDR technique was worthy of further exploration and more systematic research.

Several case studies followed which addressed some of the methodological problems of the earlier research (Cocco and Sharpe, 1993; Hassard, 1993; Kleinknecht and Morgan, 1992; Kleinknecht, 1993; Lipke and Botkin, 1992; Lohr, Tolin and Kleinknecht, 1995; McCann, 1992; Oswalt et al., 1993; Pellicer, 1993; Puk, 1991; Spates and Burnette, 1995; Spector and Huthwaite, 1993; Thomas and Gafner, 1993; Vaughan, Wiese, Gold and Tarrier, 1994; Wernik, 1993; Wolpe and Abrams, 1991; Young, 1995), as well as a case series (Goldstein and Feske, 1994). The case studies currently available in the literature generally support the efficacy of the EMDR procedure. Many authors report positive treatment outcomes using EMDR (Hassard, 1993; Kleinknecht and Morgan, 1992; Kleinknecht, 1993; Lipke and Botkin, 1992; McCann, 1992; Puk, 1991a, 1991b; Spates and Burnette, 1995; Spector and Huthwaite, 1993; Thomas and Gafner, 1993; Vaughan et al., 1994; Wernik, 1993; Wolpe and Abrams, 1991; Young, 1995), while others report mixed treatment outcomes (Boudewyns et al., 1993; Cocco and Sharpe, 1993; Goldstein and Feske, 1994; Oswalt, et al., 1993).

Although the majority of case studies substantiate the effectiveness of the EMDR technique with individuals suffering from PTSD symptomology (Cocco and Sharpe, 1993; Kleinknecht and Morgan, 1992; Kleinknecht, 1993; Lipke and Botkin,
several case studies demonstrate the effectiveness of the technique with a variety of other presenting problems, including its application with a woman suffering from disfiguring scars and body image problems (Hassard, 1993), individuals with specific phobias (Kleinknecht, 1993; Lohr et al., 1995), childhood nightmares of unknown origin (Pellicer, 1993), sexual dysfunction (Spates and Burnette, 1995; Wernik, 1993), as well as a case series evaluating its effectiveness with panic disordered individuals with and without agoraphobia (Goldstein and Feske, 1994).

Although the conclusions of the numerous case reports tend to be generally positive, overall the evidence suggests that EMDR may be more effective with some individuals than with others. Of particular note in this regard are some of the case studies reporting mixed treatment outcomes (Cocco and Sharpe, 1993; Goldstein and Feske, 1994; Oswalt, et al., 1993; Vaughan et al., 1994).

Oswalt, et al. (1993) investigated the effects of EMDR with eight subjects, five of whom were hospital inpatients, and three of whom were college students responding to a newspaper advertisement seeking individuals struggling with traumatic memories. No systematic effort was made to establish diagnosis, as this research was an attempt to replicate Shapiro's (1989a, 1989b, 1991) findings, in which the only criterion ostensibly used was the complaint of an intrusive traumatic memory. Oswalt, et al. (1993) report mixed results. Subjects were assessed at the conclusion of the treatment session, treatment success or failure was largely subjective, based on the subject's responses to the treatment procedure and self-report regarding the intrusive memory. Five of the eight were deemed not improved, while three were assessed as having benefited from the treatment. The five individuals who tended to benefit the least from
EMDR were the five inpatients, while the college students suffering from less significant traumatic experiences and presumably evidencing less overall psychopathology, responded quite well to treatment. Regarding the negative outcomes, four subjects were considerably upset (agitated, disoriented, dizzy or confused) during the treatment session, and each terminated treatment prematurely. The fifth subject did seem to respond during the EMDR session, reporting diminution of the intrusive traumatic memory, but the effects were not maintained one week later. Again, although limitations of the case study format restrict the interpretations of their findings, the results suggest that individual characteristics and existing psychopathology may be related to treatment outcome. The authors conclude that further research is needed to establish the effectiveness of the EMDR procedure with specific problems or individuals (Oswalt, et al., 1993).

Vaughan et al. (1994) assessed the effects of EMDR treatment with ten consecutive cases presenting for treatment at a PTSD clinic. Presenting diagnoses were assessed using the PTSD structured interview (Davidson, Smith, and Kudler, 1989). Eight of the ten met DSM-III-R criteria for posttraumatic stress disorder, two others had all the symptomology, but the traumatic event had occurred less than one month prior to intake. All subjects were civilians having experienced traumatic events which included: Armed robbery (three cases), an automobile accident, a violent storm, a policeman involved in a shooting, a bus driver who had hit a pedestrian, a soldier involved in a gassing accident in which three comrades were killed, and two adults suffering sequelae due to childhood abuse, including one due to incest, the other due to extensive and sadistic abuse resulting in multiple personality diagnosis in adulthood. Of the ten cases, Vaughan et al., (1994) consider eight to have been successful. Re-experiencing and hyperarousal symptoms were reduced immediately after treatment, however significant changes were maintained at follow-up only in symptoms of the re-
experiencing category. Avoidant symptoms did not change significantly immediately after treatment, but improvements were noted in this category at follow-up. Of the two cases judged not to benefit through the EMD treatment, one (suffering from the effects of childhood incest) chose to terminate treatment after the second session, finding the treatment too distressing. The other individual (diagnosed with multiple personality disorder) deemed not significantly affected by the EMD procedure, reportedly had a resumption to baseline levels of re-experiencing symptoms shortly after discharge. Overall, of the ten cases treated in this study, those with the singular, discrete traumas (single car accident, storm, bus-pedestrian accident, armed robbery and gassing accident), and with less apparent co-morbid psychopathology tended to respond most dramatically to treatment. Conversely, individuals with more extensive, prolonged traumas (child abuse histories) or with concomitant psychopathology (substance abuse, generalized anxiety, depressive symptoms or other unresolved psychotherapeutic issues) tended to have less favorable outcomes. Once again, given the limitations of the case study design, these trends may only be suggested by this research, and several questions raised for subsequent investigation.

Goldstein and Feske (1994) report on a case series in which they evaluate the effect of five EMDR sessions. Goldstein and Feske (1994) more clearly defined the characteristics and diagnosis of the participants and used standardized self-report measures and behavioral monitoring reports taken at pre-test and post-test. Subjects consisted of seven individuals who were diagnosed with panic disorder (five also with agoraphobia) using the Structured Clinical Interview for DSM-III-R, Axis I (SCID) (Spitzer, Williams, and Gibbon, 1989). Individuals with alcohol or substance dependence, obsessive compulsive disorder, social phobia or psychosis were excluded from the study, as were individuals involved in other psychotherapy who were unwilling to suspend therapy for the duration of their involvement in the study.
Goldstein and Feske (1994) report that EMDR had beneficial treatment effects in this group of panic disordered individuals. Generally, subjects reported a reduction in the frequency of panic attacks, a reduction in general anxiety levels, and a decrease in the fear of having a panic attack. In general the subjects' scores on standardized self-report measures indicated a decrease in depressive symptomology. A similar decrease in the broad range of symptoms assessed with the Brief Symptom Inventory (BSI) (Derogatis, 1975a) also suggested beneficial effects (Goldstein and Feske, 1994). Similar improvements in avoidance behavior and reductions in fear of bodily sensations were not substantiated by the data. Goldstein and Feske (1994) also note that the two individuals who were not agoraphobic attained the most significant therapeutic benefit from EMDR. This case series, with its use of systematic diagnostic evaluation and standardized outcome measures, seems to support the effects found in the earlier research. Subjects with less psychopathology tended to evidence a better therapeutic response to the EMDR intervention.

A number of case studies have attempted to more systematically define the population being investigated. Generally the case studies have become increasingly more sophisticated over time, and the researchers have provided increased clarity regarding presenting diagnosis. Some researchers have provided only a description of the presenting complaint and target symptoms (Hassard, 1993, Oswalt et al., 1993; Pellicer, 1993; Puk, 1991), while other researchers have provided what appears to be a reasonable clinical diagnosis based on presenting symptoms (Cocco and Sharpe, 1993; Kleinknecht and Morgan, 1992; Lipke and Botkin, 1992; McCann, 1992; Spates and Burnette, 1995; Spector and Huthwaite, 1993; Thomas and Gafner, 1993; Vaughan et al., 1994; Wernik, 1993; Wolpe and Abrams, 1991; Young, 1995). Still others have systematically addressed the issue of diagnosis using standardized self-report measures (Kleinknecht, 1993; Lohr et al., 1995).
Two case studies report positive outcomes in the treatment of children with post-traumatic symptoms using modified versions of Shapiro's EMDR procedure (Cocco and Sharpe, 1993; Pellicer, 1993). Cocco and Sharpe (1993) present a case study involving the successful treatment of a 4 year-old boy, who had been diagnosed as having PTSD after an armed robbery in his home. He presented with symptoms of nightmares, bedwetting, frequent verbalizations about the incident, requests for reassurance from parents, sleeping in his parent's bed and insisting on carrying a toy gun to protect himself from the "yucky guys" when leaving the family home. Cocco and Sharpe (1993) believed that the child was too young to be able to keep images of the event in mind while tracking with his eyes in saccadic movements. Therefore, the child was asked to draw a picture of the robbers and a picture of his favorite superhero. These images were used in lieu of imaginal images (traumatic image and positive cognition, respectively) during the procedure. Rather than attempt to induce saccadic eye movements Cocco and Sharpe (1993) asked the child to attend to finger clicking sounds in alternate ears for approximately 12 seconds at a time, while he thought about the event and looked at the designated image. Using this procedure, Cocco and Sharpe (1993) report that the parents reported elimination of behavior indicative of post-traumatic symptoms such as nightmares, instances of seeking reassurance from parents, telling the story of what happened, and carrying the toy gun to provide protection. However, although the frequency of bedwetting and sleeping in his parents bed had been eliminated after treatment and these gains were maintained at three month follow-up, an increase and return to pre-treatment levels were reported in these two behaviors at six-month follow-up. Thus, bedwetting and sleeping in his parent's bed required additional intervention at that time (Cocco and Sharpe, 1993).

Similarly, Pellicer (1993) used a modified EMDR protocol to address a ten year-old girl's problematic nightmares. The cognitive components of the intervention
were eliminated in the treatment of this case as Pellicer (1993) believed that the intellectual requirements involved in identifying and thinking about the various cognitions while moving the eyes would be too demanding for this child. Pellicer (1993) reported an elimination of the nightmares following treatment which was maintained at six month follow-up.

While both of these studies suggest that the EMDR protocol may be helpful in addressing PTSD symptoms in children, the results must again be interpreted with caution. Standardized instruments were not used to assess psychopathology prior to treatment nor to substantiate the treatment effects. Also, as both of these case studies applied significantly modified versions of the EMDR procedure, it is difficult to compare the effects of the modified interventions with that which might be expected if the original protocol had been used.

Montgomery and Ayllon (1994a) attempted to more systematically evaluate the effectiveness of the EMDR technique and to address some of the methodological concerns raised by reviewers such as Herbert and Mueser (1992) and Lohr et al. (1992). Montgomery and Ayllon (1994a) utilized a single subject experimental design, and they used structured clinical interviews to establish diagnosis of PTSD and Generalized Anxiety Disorder and to assess (and rule out) co-morbid Axis I or Axis II disorders. Montgomery and Ayllon (1994a) using a multiple baseline design, employed the EMDR intervention across two distinct traumatic incidents (an automobile accident and an assault at knife point). Montgomery and Ayllon (1994a) utilized the SUDs (Wolpe, 1990) and VoC scores (Shapiro, 1991) in an attempt to maintain the integrity of the intervention, but they also recorded physiological measures of anxiety during the treatment process, including heart rate and systolic blood pressure in order to assess treatment effects. In addition, Montgomery and Ayllon (1994a) asked the subject to record instances of intrusive memories and relevant behavior outside of the
treatment sessions. Their results indicated that the EMDR intervention did reduce SUDs scores during treatment, but this reduction was not generalized to the traumatic event not actively undergoing treatment. Generally reductions were also noted in physiological measures, but not to the extent that changes were noted in the subjective reports (SUDs). Behavioral self-report measures suggested that the subject no longer avoided driving or the scene of the accident, as she had prior to treatment, and there was some indication that intrusive symptoms had been reduced. The authors note that although the subject appeared to have benefited from treatment, at no time during the six EMDR treatment sessions did the subject provide a SUDs rating of zero or one (Montgomery and Ayllon, 1994a). While their results generally support the efficacy of the EMDR procedure, the results are less dramatic than those reported by several other researchers (Kleinknecht and Morgan, 1992; Lipke and Botkin, 1992; Marquis, 1991; Puk, 1991; Shapiro, 1989a, 1989b; Wolpe and Abrams, 1991).

**EMDR - Experimental Research**

Following the numerous case studies which suggested that the EMDR procedure did in fact have beneficial effects with a range of symptoms and diagnoses, several researchers (Bauman and Melnyk, 1994; Boudewyns et al., 1993; Foley and Spates, in press; Forbes, Creamer, and Rycroft, 1994; Jenson, 1994; Marquis, 1991; Renfrey and Spates, 1994; Sanderson and Carpenter, 1992; Silver, Brooks, and Obenchain, 1995; Vaughan, Armstrong, Gold, O'Connor, Jenneke, and Tarrier, 1994) began to apply more systematic, objective, and experimental methods to the questions raised by the earlier case studies. These studies tended to use larger and more clearly defined samples, make use of standardized diagnostic and assessment measures, and utilize objective measures such as behavioral observations and records or physiological measures. These studies may generally be broken down into those further
substantiating the effectiveness of the EMDR procedure with specific presenting problems or diagnostic categories (Forbes et al., 1994; Jenson, 1994; Marquis, 1991), those comparing the effectiveness of the EMDR procedure with other established interventions (Sanderson and Carpenter, 1992; Silver et al., 1995; Vaughan et al., 1994), those evaluating the contribution of specific components of the EMDR procedure itself (Bauman and Melnyk, 1994; Boudewyns et al., 1993; Foley and Spates, 1993; Montgomery and Ayllon, 1994b; Renfrey and Spates, 1994), and those evaluating expectancy variables (Gosselin and Matthews, 1995; Hekmat, Groth and Rogers, 1994).

Some researchers have attempted to substantiate the effectiveness of the EMDR procedure with specific presenting problems or diagnostic groups (Forbes et al., 1994; Jenson, 1994; Marquis, 1991). Forbes, Creamer, and Rycroft (1994) evaluated treatment outcome treating eight individuals who met criteria for PTSD on two structured interviews. They also used three standardized self-report measures and electromyogram (EMG) to assess treatment effects. Assessments (structured interviews and self-report inventories) were administered at pre-test, one-week post-test, and three-month follow-up. Subjects were given four, once weekly, ninety-minute EMDR treatment sessions conducted by therapists personally trained by Shapiro.

While all subjects had met DSM-III-R diagnostic criteria for PTSD at pre-test, Forbes et al. (1994) found that only 50% still met diagnostic criteria at follow-up. Although overall subjects were deemed to have significantly improved, residual psychopathology remained evident at follow-up. No clear pattern of symptom reduction within the PTSD diagnosis was evident; treatment did not appear to have differential effects on hyperarousal, intrusive or avoidant symptoms. Forbes et al. (1994) note that therapeutic changes on dependent measures were apparent between
pre-test and post-test, and that gains were largely maintained at follow-up. The findings were consistent on all dependent measures (clinical interviews, standardized self-report inventories and physiological measures).

Forbes et al. (1994) also assessed subjects' levels of hypnotic susceptibility, noting similarities between the EMDR and hypnotic protocols. Forbes et al. (1994) used Pearson correlation coefficients to evaluate the relationship between subject variables (age, length of time since trauma and hypnotic susceptibility). They found that only hypnotic susceptibility evidenced a significant correlation with pre-test / post test differences on treatment outcome measures. Due to the small sample size and absence of a comparison or control group, conclusions based on the Forbes et al. (1994) study regarding the efficacy of EMDR and the role of subject suggestibility must be made cautiously.

Jenson (1994) used a pre-test, post-test comparison group design to assess the effectiveness of EMDR with a group of 25 Vietnam veterans. In order to more conclusively evaluate the treatment efficacy of EMDR, Jenson (1994) utilized standardized outcome measures with this larger, and more clearly defined sample. Subjects were evaluated using a clinical interview for PTSD, and randomly assigned to either EMDR treatment or control conditions. Dependent measures included those administered at pre-test and post-test including, a structured clinical interview for PTSD, SUDs (Wolpe, 1990), and VoC (Shapiro, 1989a, 1989b, 1991). Two measures were administered only after treatment, the subjective ratings of PTSD-related goal attainment and a standardized self-report instrument to assess PTSD symptomology. Subjects assigned to the EMDR condition attended one history taking session and two EMDR treatment sessions. Subjects assigned to the control condition were given a list of available treatment options to pursue if they so chose. Differences between the EMDR and control groups were not statistically significant with the
exception of the SUDs scores (Wolpe, 1990), which indicated that the EMDR subjects reported less in-session anxiety when exposed to traumatic imagery. Jenson (1994) notes several limitations to this study. The therapists using the EMDR procedure had not had substantial experience in use of the technique, however, they may have been representative of many of the clinicians applying it in the field. In addition, the referral of control group subjects to other available treatment options may have confounded the results, although it is unlikely that any of these individuals would have been able to locate and participate in treatment focusing on PTSD symptoms in the seventeen days between pre-test and post-test. Furthermore, missing data on the SUDs and VoC measures may have resulted in too small a sample size to accurately detect a difference between the two groups. Jenson (1994) notes that PTSD in Vietnam combat veterans may be considerably different from PTSD in the civilian population. Vietnam veterans have experienced multiple, severe traumas many years prior to treatment. They have a greater tendency to abuse alcohol or other substances, causing numbing and avoidance of aversive PTSD symptoms, and typically they have difficulty trusting treating professionals. These characteristics may distinguish the Vietnam veteran from civilian populations and make them particularly difficult to effectively treat (Jenson, 1994).

Marquis (1991) explored the effectiveness of EMDR with 78 individuals, representing a wide range of presenting complaints and diagnostic categories. One hundred cases were originally included in the study, but 22 either dropped out or refused to participate or continue with EMDR treatment. Diagnoses included: Psychophysiologic reaction, eating disorder, post traumatic stress disorder, adjustment disorder, agoraphobia and panic disorder, simple phobia, relationship problems, social phobia, substance abuse, dysthymia, other anxiety disorders, learning disabilities and personality disorders. In addition smaller numbers (less than three in each category) of individuals with diagnoses of obsessive compulsive disorder, paranoia, delusional
disorder, schizophrenia and bipolar disorder were included in the study as well, although these subjects apparently were not included in some analyses.

Marquis (1991) reports significant success in the treatment of a variety of conditions using EMDR. He notes a general trend toward increased effectiveness with individuals who have sources of distress which are singular and easily isolated from other issues. The best outcomes were judged to have occurred with subjects diagnosed with PTSD, agoraphobia, panic disorder, adjustment disorders, simple phobia, and relationship problems. Marquis (1991) treated 530 themes with the 78 subjects, and he reports that overall improvement ratings for these themes averaged a rating of 1.85, almost "much improved." Marquis (1991) provides anecdotal evidence regarding the apparent effectiveness of the technique as well, including reports that the delusions of a paranoid schizophrenic were reduced, three subjects resolved stomach problems, a man suffering from delusions related to a psychotic depression gained insight and ceased obsessing, a child's depression regarding his parent's divorce was lifted and his academic performance improved dramatically, and many subjects noted relief from headaches.

There are numerous limitations to this study. The method used to establish diagnosis is not clear. Marquis (1991) notes that 40% of subjects completing the study had co-morbid conditions. Subjects participated in other outpatient treatment during the course of the study. Outcome measures consisted of subjects' ratings of improvement on a four-point rating scale, and as such were subjective evaluations and not standardized. The author used a similar scale to rate each subject's overall improvement. Demand effects were not controlled, as the writer was also the individual responsible for collecting the data. Therefore, the conclusions one can draw from this study are limited, and further research is need to more accurately predict what symptoms, individuals and diagnoses may be most effectively treated with EMDR.
One recent study is notable for its use of large sample size and rigorous scientific methodology. Wilson, Becker, and Tinker (1995) evaluated the effect of three EMDR sessions with 80 participants. Many of the methodological problems of other research were addressed in this study. Wilson et al. (1995) used a standardized diagnostic interview to establish PTSD symptomology of their subjects, of whom 46% met DSM-IV diagnostic criteria for PTSD at intake. Treatment was provided by therapists trained in the EMDR procedure, and an independent assessor, who was blind regarding treatment assignments, conducted all evaluations of treatment outcome, using standardized, self-report measures. Subjects were randomly assigned to either EMDR treatment or delayed EMDR treatment conditions, and assessments were performed at five points in time over the course of the study. The results suggest significant differences on the dependent variables between the EMDR and the delayed treatment groups. Gains noted at post-test were reportedly maintained at 90-day follow-up. Wilson et al. (1995) conclude that EMDR effectively reduced post-traumatic symptomology and increased relevant positive cognitions for the range of individuals treated in this study. Their findings suggest that dependent measures reflecting specific trauma-related symptoms tended to evidence greater change than did the more global measures, although symptom reductions of a lesser extent were noted on the more global measures as well. In addition, Wilson et al. (1995) state that the procedure appeared to be equally effective regardless of the severity of PTSD symptomology or nature of the traumatic event.

Wilson et al. (1995) note several limitations to their research. Co-morbid conditions were not assessed and behavioral outcome measures not used. In addition, therapists were monitored closely, which may have affected the manner in which the treatment was implemented and resulted in a method quite different from that used in
standard clinical practice. Overall, however this study's rigorous methodology and larger sample size provide strong support for the efficacy of the EMDR procedure.

Several researchers have compared the effectiveness of the EMDR procedure with other established interventions (Sanderson and Carpenter, 1992; Silver et al., 1995; Vaughan et al., 1994). For example, Sanderson and Carpenter (1992) evaluated the effectiveness of EMDR in treating phobic subjects. In this study 62 research subjects were randomly assigned to two treatment groups. All subjects were given one treatment session, using the standard EMD procedure and image confrontation. The order of these treatments was reversed for the two treatment groups, permitting comparisons of Subjective Units of Distress Scale (SUDS) scores over the course of the treatment session. Outcome measures consisted of variations on the SUDS scores related to subjects' subjective evaluations regarding fear of the phobic stimuli. A one-month follow-up assessment was performed. Sanderson and Carpenter (1992) found both interventions were associated with a reduction in reported fear. No significant difference was found between the effectiveness of the two treatment methods.

Although Sanderson and Carpenter (1992) evaluate the therapeutic impact of EMDR with a population other than the original PTSD population, the procedure for including / excluding subjects is unclear. Sanderson and Carpenter (1992) did an analysis of the data for a sub-set of the subject sample, noting that the individuals with symptoms more closely resembling PTSD appeared to improve more significantly from both of these treatment methods. Overall the population sample used in this study is not clearly defined, and the post hoc analysis of a sub-group of subjects with phobias related to traumatic events, suggests the need for further research with a more clearly defined subject sample.

Silver et al. (1995) took advantage of pre-existing program evaluation data collected at a Veterans Association Medical Center to determine if patients treated with
EMDR had better treatment outcomes than those treated with more traditional approaches including biofeedback and relaxation training. All data were self-report. Although positive changes were noted for all treatment groups as compared to the control group (patients who received standard PTSD program only), only the EMDR treatment group was statistically significant from the control group. Silver et al. (1995) conclude that EMDR was more effective than relaxation training and biofeedback in the treatment of PTSD for Vietnam Veterans. EMDR treatment appeared to impact re-experiencing symptoms of PTSD most significantly, although clinical changes in anxiety, anger, depression and relationship problems were also noted. This study has several limitations, most notably that it relied on pre-existing, self-report data, and that the subjects had volunteered for the specific treatments and therefore were not randomly assigned to treatment conditions.

Vaughan et al. (1994) evaluated the effectiveness of three treatments for PTSD, including eye movement desensitization (EMD), image habituation training (IHT), applied muscle relaxation (AMR) and compared these to wait list control. Dependent measures included structured, clinical interviews for PTSD and anxiety disorders conducted by a blind rater at four times over the course of the study, patient reports of the therapist's empathy, warmth and genuineness, standardized self-report measures such as the state portion of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, and Jacobs, 1983), the Beck Depression Inventory (Beck, 1978), and the Impact of Events Scale (Horowitz et al., 1979). All treatment groups benefited from treatment, and differences between those undergoing treatment and wait-list controls were statistically significant on total PTSD symptoms, avoidant symptoms, hyperarousal symptoms and depression. Pre-test, post-test differences between treatment groups and wait-list control subjects for re-experiencing symptoms of PTSD failed to reach statistical significance. Only subjects treated with EMD showed
statistically significant differences on measures of re-experiencing symptoms such as flashbacks and nightmares. Vaughan et al. (1994) conclude that this study suggests that all three treatments are helpful in addressing PTSD symptomology, but that EMD appeared to be more effective in addressing the re-experiencing and intrusive symptoms than image habituation training (IHT) or applied muscle relaxation (AMR). Vaughan et al. (1994) raise questions regarding the reasons for the apparent effectiveness of the EMD procedure. They suggest that a number of characteristics of the protocol may contribute to its effectiveness and that future research should further evaluate the contribution of the eye movements, focused imaginal exposure, and cognitive restructuring components. In addition, Vaughan et al. (1994) state that while they believe that excellent therapeutic outcomes may be achieved through the use of EMD, it is not a quick and simple treatment but rather one that needs to be carried out within a therapeutic context by a therapist with well-developed clinical skills and knowledge of cognitive therapy techniques.

Perhaps due to the name given to the treatment, or due to Shapiro's claims regarding the desensitizing effect of saccadic eye movements (Shapiro, 1989a, 1989b, 1991), many researchers have emphasized the effects of the eye movements themselves (Tallis and Smith, 1994, Wolpe and Abrams, 1991). In their case study, Wolpe and Abrams (1991) used saccadic eye movements as one would generally use relaxation procedures within a systematic desensitization procedure. They established a hierarchy of anxiety producing stimuli and used imaginal exposure and eye movements along this hierarchy. This procedure was clearly a departure from the protocol outlined by Shapiro (1989a, 1989b, 1991), and assumes that it is the eye movements that produce the desensitizing effect.

Tallis and Smith (1994) used a pre-test, post-test comparison group design to evaluate the desensitizing effect of rapid eye movements, slow eye movements, and
stationary imagery. Fifty undergraduate college students were recruited and exposed to a contrived trauma (looking at a photograph of a mutilated body and hearing a loud, unpleasant noise). Subjects provided SUDs (Wolpe, 1991) scores immediately after experiencing the contrived trauma and at ten second intervals during the eye movements. Tallis and Smith (1994) found that after twenty sets of saccadic eye movements the subjects in the rapid eye movement group continued to report high SUDs scores, whereas those in the slow eye movement and the stationary image conditions showed significant reductions on this measure. Tallis and Smith (1994) conclude that rapid eye movements do not facilitate emotional processing with this population of college students, noting that these results may not generalize to the clinical populations usually treated with the EMDR procedure.

Numerous researchers have noted that the EMDR protocol contains several distinct elements and they have attempted to evaluate its essential or necessary components (Bauman and Melnyk, 1994; Boudewyns, et al., 1993; Foley and Spates, in press; Montgomery and Ayllon, 1994b; Renfrey and Spates, 1994). In contrast with other researchers who have focused exclusively on the effects of the eye movements themselves (Tallis and Smith, 1994), these researchers have attempted to establish whether eye movements even play an essential role in the EMDR protocol (Bauman and Melnyk, 1994; Foley and Spates; 1996; Renfrey and Spates; 1994). Renfrey and Spates (1994) identify seven components of the EMDR protocol, including exposure to trauma related imagery, exposure to aversive trauma related imagery, exposure to aversive trauma related cognitions, rehearsal of adaptive cognitions, rapid eye movements, active visual attention to moving target (therapist's fingers), thought and image stopping, and a deep breath at the end of each set of saccadic eye movements. Comparing EMDR to other exposure procedures, Goldstein and Feske (1994) note that several unique elements of EMDR may contribute to its apparent effectiveness. These
include the free-flowing nature of the treatment process, the intensely focused nature of the treatment, the physical proximity of the therapist, and the cognitive restructuring component. Several researchers have attempted to evaluate the essential or contributory features of the EMDR protocol.

Bauman and Melnyk (1994) used a pre-test, post-test comparison group design to evaluate the comparative effectiveness of EMDR and a similar treatment in which the eye movements were replaced with finger tapping of alternate hands. This research compared the treatment outcomes for 30 volunteer subjects who had been recruited from an introductory statistics class, and who met criteria for test anxiety as measured on a standardized instrument. Dependent measures included standardized self-report instruments for test anxiety taken before treatment and at follow-up, SUDs (Wolpe, 1990) and VoC (Shapiro, 1991) scores during the treatment process. Analysis of the data revealed that pre-test, post-test differences were statistically significant for both treatments, but the difference between the two treatment methods was not statistically significant (Bauman and Melnyk, 1994). They conclude that eye movements are not essential to the effectiveness of the EMDR protocol.

Bauman and Melnyk (1994) note that changes in SUDs tended to be larger for those treated with eye movements, and they noted that several subjects in the finger tapping group seemed to be tapping automatically, while subjects in the eye movement group had more difficulty engaging in the eye movements. Bauman and Melnyk (1994) suggest that perhaps the eye movements provide a greater distraction, interfering with the ability to keep the disturbing image in mind. Bauman and Melnyk (1994) hypothesize that moderately distracting activities may function as well as the eye movements in the treatment protocol, and suggest this as an area for future research.

In addition, Bauman and Melnyk (1994) note the importance of another aspect of the treatment protocol which may in part be responsible for treatment efficacy. They
suggest that the act of repeatedly "blinking out" the image may itself have some therapeutic benefit. When subjects experienced difficulty "blinking out" the image, Bauman and Melnyk (1994) assisted them with conversation regarding unrelated activities, however, even without this deliberate effort to assist subjects in this process, it is possible that they learn to effectively focus on the memory and divert their attention from the memory at will during the treatment process.

Montgomery and Ayllon (1994b) made use of a multiple baseline across subjects design to investigate the treatment efficacy of EMDR. They were interested in evaluating the effect of the saccadic eye movements verses the effect of exposure itself. Montgomery and Ayllon (1994b) clearly defined the subjects included in this research using structured interviews and standardized self-report instruments to assess symptoms and diagnosis. The six subjects met criteria for PTSD, but not as a result of military service. Subjects were excluded from the study if they were taking antipsychotic medication or if they were involved in ongoing psychotherapy which addressed PTSD symptomology. Subjects were also excluded if they were judged to have co-morbid diagnosis of obsessive compulsive disorder, substance abuse or dependence, schizophrenia, multiple personality disorder or delusional disorder, and if they had cardiovascular problems or homicidal / suicidal ideation. Dependent variables included subjective reports of anxiety as well as physiological measures of heart rate and blood pressure and subjects' weekly self-monitoring records of presenting complaints (i.e., intrusive thoughts, flashbacks, and sleep disturbances). All subjects were exposed to all phases of the study, including baseline, modified (non-saccadic) EMD, standard EMD, and follow-up phases. In both treatment phases Montgomery and Ayllon (1994b) followed the EMD protocol, but in the modified, non-saccadic EMD the saccadic eye movements were eliminated and subjects were asked to focus instead on a fixed point for a comparable length of time. Data regarding subjective
assessment of anxiety and physiological measures were recorded during all phases of
the study. Montgomery and Ayllon (1994b) conclude that the EMD procedure was
efficacious in the treatment of posttraumatic symptoms, particularly as measured
through the self-report instruments, although for five out of six subjects six EMD
sessions were necessary to obtain a significant treatment effect. Although physiological
measures reflected reductions in anxiety levels as a result of EMD, these changes were
not deemed to be statistically significant. The data reflect consistent reductions in
dependent variables only during the EMD phase of the study, suggesting that use of the
modified EMD protocol (without the saccadic eye movements) did not result in similar
changes in self reported anxiety or systematic reductions in physiological measures of
anxiety (Montgomery and Ayllon, 1994b).

Foley and Spates (in press) utilized a pre-test, post-test comparison group
design to evaluate the treatment effects of EMDR and an alternative treatment in
addressing public speaking anxiety in college students. In this study subjects in the
alternative treatment condition were asked to look at and focus on, a stationary target
for a period of time comparable to that in which the other subjects would be asked to
move their eyes in saccadic motions. Otherwise the two procedures were identical.
Foley and Spates (1993) used standardized measures of treatment outcome, including a
standardized rating scale of speech anxiety, and found that while speech anxiety was
reduced for both groups at follow-up, there was no statistically significant difference
between the two treatment groups.

Similarly, Renfrey and Spates (1994) used a dismantling procedure to evaluate
some of the essential features of the EMDR procedure. Renfrey and Spates (1994)
used a pre-test, post-test comparison group design to compare the effectiveness of three
treatment protocols, EMD, automated EMD, and visual fixation (replacing eye
movements in otherwise similar EMD protocol). Subjects were evaluated for PTSD
symptoms using a structured clinical interview. Subjects with extreme paranoid thinking or evidence of psychosis were screened from the study. Twenty-three subjects, randomly assigned to one of the three treatment conditions, completed the study. Dependent variables included heart rate, SUDs (Wolpe, 1990), VoC ratings (Shapiro, 1989a, 1989b, 1991), Symptom Checklist - 90 - Revised (SCL-90-R) depression and anxiety measures (Derogatis, 1975b), scores on a structured interview assessing PTSD symptoms and Impact of Events (IES) intrusion and avoidance scores (Horowitz et al., 1979).

Renfrey and Spates (1994) reported significant clinical effects on all dependent measures (standardized self-report instruments, heart rate, SUDs scores, and VoC scores) for all three treatment groups. In addition, while twenty-one of the twenty-three subjects had met diagnostic criteria for PTSD at intake, only five still met full criteria at follow-up. Renfrey and Spates (1994) conclude that the eye movements are not an essential component of effective treatment, and their research substantiates the effectiveness of the complete protocol in providing desensitization and cognitive restructuring of traumatic memories.

Similarly, Boudewyns et al. (1993) report the results of a controlled outcome study used to evaluate the effectiveness of the EMDR procedure, controlling for the effect of exposure. The subjects were twenty male Vietnam veterans meeting diagnostic criteria for PTSD. Subjects were randomly assigned to one of three groups: EMDR, exposure control, or control group. Subjects in the EMDR and exposure control group received two treatment sessions. The EMDR group received treatment according to the protocol outlined by Shapiro (1989a, 1989b). Subjects in the exposure control group were asked to recall a memory in the same manner as those in the EMDR group, but saccadic eye movements were not used. The control group received no individual sessions. Outcome measures included the intrusion and
avoidance subscales on a structured clinical interview, Subjective Units of Distress Scores (SUDS) (Wolpe, 1990), Impact of Events Scale (IES) (Horowitz et al., 1979), therapist ratings of treatment outcome, and physiological measures such as skin conductance, hand temperature, electromyographic response (EMG), and heart rate. Initial physiological data were collected as the subject described the traumatic event, and during post-treatment assessments the readings were taken as the subjects listened to a tape-recording of their original rendition of the trauma. This procedure may be problematic because these two activities, recording the story and listening to oneself tell the story on tape, are different events, and other factors may account for changes in physiological measures during these two activities.

Boudewyns et al. (1993) found that EMDR subjects reported more reduction in SUDS levels than the exposure control subjects, but that comparable differences between the EMDR and exposure control group on the psychological and physiological measures were not found. Boudewyns et al. (1993) conclude that subjects may have reported greater reductions in anxiety levels during EMDR because the expectancy was greater for this novel and unusual intervention during treatment, but that this placebo effect is not strong enough to be maintained outside of the treatment session. Boudewyns et al. (1993) suggest that this chronic population of Vietnam veterans may tend to under-report beneficial changes on standardized self report measures due to secondary gain issues, and actual differences between the treatment groups may have been obscured in this manner. Recognizing the limitations of their study Boudewyns et al. (1993) suggest that future research might more fully explore the efficacy of EMDR utilizing more treatment sessions, a longer-term follow-up and less chronic subjects.

Lohr, et al. (1992) have suggested that additional research might evaluate subjects' confidence in the procedure before and after treatment in order to assess the impact of expectancy variables and the extent to which the therapist's expectations
regarding treatment efficacy may be communicated to subjects in subtle and unintentional ways. It was noted earlier that Forbes et al. (1994) assessed subjects' levels of hypnotic susceptibility and found a significant correlation with pre-test / post test differences on treatment outcome measures. However, limitations of the Forbes et al. (1994) study, including the small sample size (eight subjects) and lack of a control or comparison group, limit the conclusions made on the basis of their findings. However, other researchers have begun to explore the issues of hypnotic susceptibility and expectancy and their relationship to treatment outcome (Gosselin and Matthews, 1995; and Hekmat, Groth and Rogers, 1994).

Gosselin and Matthews (1995) compared treatment outcomes for two treatment protocols (standard EMDR, and a similar protocol with no eye movement) in addressing symptoms associated with test anxiety in college students. They compared outcomes associated with high expectancy and low expectancy conditions for both treatments. Dependent variables included SUDs (Wolpe, 1990), VoC (Shapiro, 1991), and a standardized, self-report measurement of test anxiety. Subjects in the low expectancy condition were provided instructions which referred to the newness of the technique and the need to evaluate its effectiveness. Subjects in the high expectancy condition were told that the treatment was "powerful" and associated with "remarkable positive results."

The results suggest that subjects in the eye movement treatment condition reported significantly greater reductions in SUDs scores than did subjects in the no eye movement condition, but that both groups demonstrated improvement on symptoms of test anxiety as measured with the standardized, self-report treatment outcome measure. In addition, although subjects in the eye movement condition tended to evidence larger increases in VoC scores, there was no significant difference noted between the two treatment groups. Although the researchers had hypothesized that treatment outcomes
would be better for subjects in the high expectancy condition, the data did not support this conclusion. Gosselin and Matthews (1995) explain the lack of effect of the expectancy manipulation, suggesting that subjects participating in the study have a general positive expectancy regarding treatment outcome, demand characteristics of the study are more powerful and therefore the impact of the instructions is comparatively inconsequential.

Hekmat, Groth and Rogers (1994) took a different tact in evaluating the contribution of expectancy variables. This study evaluated the pain ameliorating effect of three conditions (EMDR, similar protocol with music replacing rehearsal of relevant cognitions, and control) and assessed subjects for levels of hypnotic susceptibility. Thirty undergraduate students were randomly assigned to one of the three conditions. The researchers assessed levels of hypnotic susceptibility using a standardized measure, and evaluated affective states using a self-report measure. Subjects were also queried regarding the credibility of treatment. Hekmat et al. (1994) administered a cold pressor task (submerging dominant hand in ice water) on three occasions (baseline, during, and after eye movement intervention) to evaluate pain threshold, tolerance and endurance.

Hekmat et al. (1994) found that both interventions were effective in increasing pain threshold and tolerance, and while not statistically different from each other, statistical differences were evident as compared to the control group. Likewise, differences in pain endurance from pre-test to post-test were only statistically significant for the treatment groups. Subjects apparently rated both treatments as equally credible, and both treatments apparently had a significant effect on reports of mood states, with the EMDR intervention having a significant anxiety-reducing effect. Lastly, hypnotic susceptibility was found to be unrelated to treatment effects. Regarding this last point, the authors conclude that the apparent effects of the EMDR intervention appear to be
unrelated to hypnotic susceptibility. Limitations of this study include its use of interventions which have been modified to accommodate the cold pressor task, it evaluates treatment effects with a non-clinical population, and targets a non-traumatic event (pain of ice water immersion). Therefore, although the results of this study are suggestive, further research is needed to substantiate these findings.

In sum, more rigorous evaluation is needed in order to better understand why and with whom EMDR treatment is effective (Herbert and Mueser, 1992; Lohr, et al., 1992; Oswalt, et al., 1993). A number questions remain. Although some trends have been suggested in the literature, the relationship between subject characteristics and treatment outcome remains unclear. The essential components of EMDR protocol have yet to be identified. The effects of expectancy variables and the relationship between hypnotic susceptibility and treatment outcome have only begun to be systematically explored. Increasingly rigorous investigations are evident in the current literature, and trends utilizing larger sample sizes, standardized instruments, and more clearly defined populations should continue if these questions are to be more clearly answered in the future.

Exposure to Traumatic Imagery

As noted earlier, exposure techniques have been demonstrated to be effective in addressing some of the symptoms characteristic of PTSD (Boudewyns and Hyer, 1990; Cooper and Clum, 1989; Foa et al., 1991; Keane et al., 1989). The means by which an individual is asked to imagine the traumatic imagery may be related to treatment outcome. Lang proposes that behavior related to the experience of fear and anxiety involves a number of "propositional" components, including imaginal, linguistic, and physiological responses (Lang, 1977, 1979, 1985; Lang, Levin, Miller, and Kozak, 1983). During flooding procedures, subjects taught to re-experience feared
events in a number of stimulus dimensions (emphasizing somatomotor and visceral responses) evidenced greater physiological arousal than those who were instructed to imagine the scene in detail. Furthermore, subjects experiencing greater increases in physiological arousal during exposure / flooding have been found to have generally better treatment outcomes (Lang, 1977). Therefore, exposure to the imaginal, sensory / physiological and cognitive aspects of a stimulus would be expected to result in greater physiological arousal and ultimately better treatment outcomes.

Although the EMDR procedure contains several other elements as well, it includes a significant imaginal exposure component. The individual is repeatedly asked to imagine the traumatic event during the procedure, keeping in mind the thoughts, images and physical sensations associated with the event. The method of recalling this experience may be important. In Shapiro's (1989a, 1989b) original study she compared the EMDR protocol with a placebo treatment which also utilized an imaginal exposure component. One significant difference, however, between the two protocols was the means by which the subjects were asked to recall their traumatic experiences in the two conditions. The EMDR subjects were told to imagine the event including the images, cognitions and feelings associated with it, while the control subjects were simply instructed to describe what happened for a comparable period of time.

The effectiveness of the EMDR procedure may lie in its similarity to other behavioral interventions which rely on exposure to traumatic images, feelings and cognitions. Simply exposing an individual to the thoughts, feelings and images associated with a traumatic event, may desensitize him / her in a manner analogous to a classically conditioned extinction procedure. The power of mere exposure to the cognitive, affective and sensory aspects of a trauma should not be underestimated.

Therapeutic effects have been demonstrated even in the context of private writing (Pennybaker, 1993; Pennybaker and Beall, 1986). Pennybaker and Beall

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(1986) divided a sample of 46 college students into three groups. Subjects in each group were asked to write in private for 20-minute sessions on each of four consecutive days. Subjects in the first group were instructed to write on specific neutral topics (i.e., the appearance of the room, or what they were wearing). Subjects in the other two groups were instructed to write about a traumatic event they had experienced, but were asked to do so in different ways. Subjects in one group were instructed to write only regarding their feelings surrounding the event, while subjects in the last group were instructed to write both about the details of the event and the feelings associated with it.

The results of this research indicated that those who wrote about neutral topics benefited the least and evidenced the least physiological arousal and emotional distress during the sessions. Those who wrote only about feelings benefited more than the neutral writing group, but less than those who wrote about both cognitive and affective components of the traumatic event. While this last group evidenced increased physiological arousal and reported more emotional distress during the writing periods, they obtained the most significant long-term benefits including improved physical and psychological health. Subjects who wrote about a personally distressing experience reported having benefited from the study, suggesting that it assisted them in identifying their feelings and better coping with the event. Apparently, even in the absence of a therapist, individuals may gain significant benefit through the opportunity to write about a disturbing event, especially when instructed to address both its affective and cognitive aspects (Pennybaker and Beall, 1986).

Pennybaker (1993) concludes that individuals who benefit most through the private writing exercise are those who address all components of the event and who express negative emotions regarding the event (sadness, guilt, fear, anger), and who tend to develop a clear cognitive story over the course of their writings. Although these
studies were designed to investigate the correlation between the expression of feelings surrounding a traumatic incident and subsequent health, they demonstrate that subjects benefit on a psychological level when contacting traumatic material, even when done in private for short periods of time (Pennybaker, 1993; Pennybaker and Beall, 1986).

Rationale for Study

Since its introduction, EMDR has shown considerable promise in the treatment of PTSD, but the reasons for its apparent effectiveness remain unclear. Likewise, individual characteristics including defined diagnosis and symptom profile, hypnotizability, and expectancy regarding treatment effectiveness, and their relationship to treatment outcome remain to be more systematically explored. At present, research regarding the effectiveness of the EMDR procedure is only suggestive and criticisms of the available research suggest refinements for future research. The use of established experimental designs (either group or single-subject designs) allow investigators to rule out the effect of extraneous variables and more accurately assess the effectiveness of the procedure itself. Outcome measures with established psychometric properties should be utilized, with less reliance on non-standardized self-report measures. The use of physiological or behavioral measures would help to objectively assess treatment effectiveness and support results obtained with self-report measures. The effect of expectancy variables should be assessed more systematically, including some evaluation of confidence in treatment before and after the procedures are implemented. Subject characteristics and psychiatric diagnosis should be identified and treatment effectiveness with defined populations should be specified in order to better understand the individuals most likely to benefit from this treatment.

Some authors have noted that individuals evidencing symptoms associated with the diagnosis of post-traumatic stress disorder (PTSD) tend to be highly suggestible
and hypnotizable (Spiegel et al., 1988; Stutman and Bliss, 1985). Eye Movement Desensitization and Reprocessing (EMDR) has been demonstrated to be highly effective in many PTSD cases, and may be so in part, because of the higher level of suggestibility / hypnotizability of these individuals. The relationship between hypnotizability and the effectiveness of the EMDR procedure remains virtually unexplored.

Other research has demonstrated the importance of addressing the various levels on which a traumatic event is experienced (cognitive, emotional and physiological responses) in treating traumatic sequelae (Pennybaker and Beall, 1986; Pennybaker, 1993). The effectiveness of the EMDR procedure may, in part, be due to the fact that it focuses the attention of the subject on all levels of the traumatic experience. The effect of the exposure component of the EMDR procedure remains unclear.

This study seeks to identify the factors which may be related to positive treatment outcome using EMDR or structured writing sessions to impact PTSD symptomology with a more clearly defined subject population.

1. It attempts to clarify the effectiveness of two treatment procedures (EMDR and structured writing sessions) on a defined population of individuals using established psychometric instruments to assess treatment outcome.

2. It assesses the relationship between subject characteristics (including trauma experience and PTSD symptoms) and treatment outcome.

3. It explores the impact of expectancy variables by assessing confidence levels of all subjects regarding treatment both before and after treatment.

4. Lastly, this study investigates the relationship between suggestibility / hypnotizability and treatment effectiveness for PTSD symptomology.
METHODS

Subjects

Recruitment of Subjects

Recruitment strategies included: Newspaper advertisements, public service announcements, public postings, requests for referrals from members of local professional and community organizations, and requests for appropriate referrals from mental health practitioners in the community, Western Michigan University Psychology Clinic, Western Michigan University Counseling Center Clinic.

Characteristics of Subjects

Males or females over the age of 18 were considered for participation. Potential subjects were assessed using the Computerized Diagnostic Interview Schedule (CDIS) for symptoms of post-traumatic stress disorder (Robins, Helzer, Croughan and Ratcliff, 1981). Qualifying subjects met the following criteria: All subjects must have experienced a traumatic event as defined by part "a" of the DSM-IV diagnostic criteria for PTSD, and reported having experienced symptoms for a duration of at least one month, consistent with the criteria for PTSD diagnosis. Qualifying subjects had evidence of at least one of the following other DSM-IV criteria for PTSD: (b) re-experiencing the event (i.e., intrusive thoughts, dreams, flashbacks), (c) persistent avoidance of stimuli associated with the trauma, (d) hyperarousal, (i.e., sleep disturbances, hypervigilence, increased physiologic reactivity to associated stimuli).
Potential subjects were evaluated for co-morbid psychiatric diagnosis, excluding individuals with significant DSM-IV Axis II diagnosis, diagnosis of obsessive compulsive disorder, lack of reality orientation, history of psychotic episodes, or with significant paranoid ideation. The Symptom Checklist - 90 - Revised (SCL-90-R) (Derogatis, 1975b) and the Personality Diagnosis Questionnaire - Revised (PDQ-R) (Hyler, Rieder, Williams, Spitzer, Hendler, and Lyons, 1987) were used in conjunction with the Computerized Diagnostic Interview Schedule (CDIS) to make this determination. Diagnosis of obsessive compulsive disorder or schizophrenia with supporting evidence on the analogous sub-scales of the SCL-90-R, constituted grounds for exclusion from participation. Likewise, high scores on the borderline, obsessive compulsive, schizotypal, schizoid, and antisocial subscales of the PDQ-R were grounds for exclusion when there was substantiating evidence from the analogous CDIS or SCL-90-R subscales or when less structured clinical questioning confirmed the existence of long-standing personality traits consistent with these personality diagnoses.

Setting

Assessment and treatment sessions were conducted in private therapy rooms at the Western Michigan University Psychology Clinic, although some of the intake and follow-up sessions were conducted in private therapy rooms at Kalamazoo Psychology, P.C.

Materials

Other than assessment instruments, few other materials were needed to conduct this study. A personal computer was used to administer the computerized interviews, paper and writing utensils were provided for subjects during the structured writing
sessions, and a comfortable chair, an audiotape and a tapeplayer were used in administration of the standardized hypnotizability scale.

Diagnostic and Assessment Instruments

A number of clinical assessment instruments were used in conducting this study, including: The Computerized Diagnostic Interview Schedule (CDIS) (Robins et al., 1981), computerized version of the Personality Diagnosis Questionnaire - Revised (PDQ-R) (Hyler et al., 1987), the state portion of the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983), Symptom Checklist - 90 - Revised (SCL-90-R) (Derogatis, 1975b), Impact of Events Scale (IES) (Horowitz et al., 1979), Subjective Units of Distress Scale (SUDS) (Wolpe, 1990), Validity of Cognition Scale (VoC) (Shapiro, 1991), the Stanford Hypnotic Susceptibility Scale (Weitzenhoffer and Hilgard, 1959), and a scale developed for use in this study to measure expectancies regarding treatment efficacy, the Treatment Efficacy Expectancy Scale (TEES). (See Appendix A.)

The Computerized Diagnostic Interview Schedule (CDIS) (Robins et al., 1981) is a structured clinical interview, designed to be used by trained lay interviewers to provide diagnosis consistent with DSM-III-R (APA, 1980) (Feighner, Robins and Guze, 1972) and Research Diagnostic Criteria (Spitzer, Endicott and Robins, 1978). The interview is standardized, consisting of a sequence of closed-ended questions. The CDIS has been designed to reduce probing and judgment on the part of the interviewer during administration, and at the conclusion of the interview the computer makes the final diagnosis (Robins et al., 1981).

The SCL-90-R is a 90 item self-report instrument which provides three scores reflecting global functioning (global severity index, positive symptom distress index, positive symptom total) and nine sub-scores for more specific symptom clusters.
(somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism). The SCL-90-R has high internal consistency across scales (Coefficient Alpha = .77 to .90 and good construct validity (Derogatis, 1975b). In this study, the SCL-90-R was used to screen potential subjects for specific characteristics (i.e., paranoid and psychotic symptoms) and T scores above 60 on these subscales were grounds for exclusion, when evidence of psychoticism, paranoia or lack of reality testing was substantiated on the CDIS or PDQR. In addition, the SCL-90-R was utilized as a measure of symptom change over the course of the study. It was administered during the initial screening, post-test and follow-up sessions.

The Impact of Events Scale (IES) is a 15-item scale designed to assess the cognitive impact of traumatic events, evaluating severity of both avoidant and intrusive symptoms of PTSD (Horowitz et al., 1979). The Impact of Events Scale (IES) has high test-retest reliability (r = 0.87) and high split-half reliability (r = 0.86), and has been shown to be sensitive to therapeutic changes in relevant symptoms over time (Horowitz et al., 1979). The IES was utilized as a measure of symptom change over the course of this study and was administered during the initial screening, post-test and follow-up sessions.

The Personality Diagnosis Questionnaire - Revised (PDQ-R) (Hyler et al., 1987) is a questionnaire which may be administered and scored using a computer. It consists of 152 statements answered true or false. Questions attempt to assess characteristics and criteria consistent with diagnosis of specific personality disorders (including schizoid, schizotypal, paranoid, avoidant, dependent, obsessive-compulsive, passive-aggressive, self-defeating, histrionic, narcissistic, borderline, antisocial, conduct disorder, and sadistic personality disorders). The instrument may tend to overdiagnose personality disorders, so results may best be considered
suggestive and should be explored further to substantiate the diagnosis (S. E. Hyler, personal communication, June 26, 1992).

The state portion of the State-Trait Anxiety Inventory (Form Y) (STAI) (Spielberger, Gorsuch, Lushene, Vagg, and Jacobs, 1983) was used in this study to assess the subjective experience of anxiety at the time the questionnaire is completed. This standardized, self-report instrument consists of 20 items, each endorsed on a four-point scale. Scores are summed and divided by the number of questions answered to obtain an average score on all items. Measures of internal consistency are reasonably high (median alpha coefficient of .93) and the instrument has face validity.

The Subjective Units of Distress Scale (SUDS) (Wolpe, 1990) has been used extensively in anxiety disorders research. The subject provides a subjective rating of how he or she is feeling at the time on an eleven point scale, on which a rating of zero represents a completely calm and relaxed state, and a rating of ten, the worst distress possible.

Validity of Cognition Scale (VoC) is a seven point scale developed by Shapiro (1991), which has been incorporated into the cognitive component of the EMDR protocol. The subject is asked to rate how true a statement or belief feels at the time. This scale ranges from a score of one (completely untrue) to a score of seven (completely true).

The Stanford Hypnotic Susceptibility Scale (Weitzenhoffer and Hilgard, 1959) consists of two equivalent forms (A and B). (We used form A.) This scale is administered to one subject at a time. Administration of the scale involves interacting with the subject, establishing rapport, and answering questions the subject may have about hypnosis in the first part of the session, then proceeding with a standardized hypnotic induction and rating the subject’s responses to the hypnotic suggestions (12 items) in the middle portion of the session. Lastly the experience is discussed with the
subject and the session is concluded. Responses to suggestions are scored "+" if the person behaves as a hypnotized person would be expected to behave. Specific, objective criteria are established for each response. Scores on this scale may therefore range from zero (someone who failed to act as a hypnotized person on all items) to twelve (someone who behaved as if hypnotized on all items). In administering this scale we interacted with the subjects only in the initial and final portions of the session. During the middle part of the session, we utilized a tape recording of the hypnotic induction and suggestions while the subject was observed through a one-way mirror. This provided considerable consistency in the manner this assessment was conducted.

A simple scale was constructed to measure expectancy regarding treatment efficacy, which asks subjects to rate expected treatment effectiveness along a 5-point scale. The Treatment Efficacy Expectancy Scale (TEES) is subjective and not standardized, but it has obvious face validity. (See Appendix A.)

Experimental Design

The study was designed to evaluate the differential impact of two interventions on subjects with varying, defined characteristics. The study utilized a pre-test, post-test comparison group design and ANOVA for repeated measures at pre-test, post-test and follow-up for the two treatment groups (EMDR and structured writing). In addition, the study used individual difference measures to evaluate the relationship between hypnotizability and treatment expectancy with outcome of therapy.

Independent Variables

Numerous subject characteristics were assessed prior to the implementation of an intervention for post-traumatic symptoms. The nature of the traumatic event, specific PTSD symptomology, level of expectation regarding treatment efficacy, and
each subject's level of hypnotizability were assessed prior to treatment. Two interventions were employed in this research. Eye movement desensitization and reprocessing was administered by therapists trained by Shapiro, and a written protocol was followed to help ensure this intervention was consistently employed. Structured writing sessions were administered by individuals specifically trained to implement this intervention, and a written protocol was followed to ensure consistency in its implementation as well.

**Dependent Variables**

The CDIS (Robins et al., 1981) is a structured clinical interview that was used to provide information relevant to exclusion and inclusion decisions at intake, but information regarding subject characteristics and PTSD symptomology were also used as dependent variables for the analysis of treatment effects. Although subjective in nature, Subjective Units of Distress Scale (SUDS) (Wolpe, 1990) and Validity of Cognition Scale (VoC) (Shapiro, 1991) were utilized as their use is part of the standard EMDR protocol. In addition, standardized, self-report measures were used to measure treatment effects. These included the Symptom Checklist - 90 - Revised (SCL-90-R) (Derogatis, 1975b), the state portion of the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983), and the Impact of Events Scale (IES) (Horowitz et al., 1979). The Treatment Efficacy Expectancy Scale (TEES) was used to evaluate expectancy variables.

**Procedures**

Individuals expressing interest in the study were contacted by telephone. After the nature of the research and the expectations regarding participation were explained, the potential participant was queried regarding traumatic experiences and post-traumatic
symptoms. If the individual wanted to participate and seemed appropriate for the study an intake session was scheduled. The first session (intake) was an assessment session. Informed consent for participation was obtained. During this screening session, subjects were asked to complete the Symptom Checklist - 90 - Revised (SCL-90-R) (Derogatis, 1975b) to determine if they should be excluded from the study on the basis of paranoid ideation or impaired reality testing. Scores on this scale were used as a dependent variable as well. This questionnaire is self-administered and takes approximately 15 minutes to complete.

Subjects were administered two structured clinical interviews during the first session, the Computerized Diagnostic Interview Schedule (C-DIS) (Robins et al., 1981) and the Personality Diagnostic Questionnaire - Revised (PDQ-R) (Hyler, et al., 1987). Each of these structured interviews lasted between 30 - 50 minutes. If desired, subjects were given a 10 minute break between the structured clinical interviews. The C-DIS was used to assess PTSD symptomology for inclusion purposes, and to assess psychosis and obsessive-compulsive disorder for exclusion purposes. The Personality Diagnosis Questionnaire - Revised was used to suggest co-morbid Axis II symptomology, which, if significant, constitutes an exclusion criterion.

Basic demographic information was collected for all persons presenting for participation, along with contact information for follow-up assessment purposes for those who qualify for inclusion. Subjects were notified as soon as possible regarding inclusion or exclusion from the research, in most cases at the conclusion of the first screening session. Those excluded were given the reason for exclusion and if not already in treatment, and treatment was deemed advisable, referred to local practitioners. Names of appropriate service providers in the community were made available under these circumstances.
At the conclusion of the initial screening session, subjects were scheduled for a second assessment session to determine levels of hypnotic suggestibility. During this second session, a standardized instrument, the Stanford Hypnotic Suggestibility Scale (Weitzenhoffer and Hilgard, 1963) was administered, and a standard protocol was used. The researcher or a trained research assistant interacted with the subject at the beginning of the session in order to establish rapport, clarify what to expect of the session itself, and to ensure the subject's comfort, safety and willingness to participate. Then an audiotape of the standard protocol was played for each subject, and the researcher or research assistant rated the responses as the subject was observed through a one-way mirror. When the audiotape ended, the researcher or research assistant returned to the room to conclude the session and to answer any questions or concerns the participant may have had at that time. An effort was made to have at least two individuals observing and rating these sessions, in order to maintain reliability of our observations and procedures. Inter-rater reliability data were collected during the sessions with two or more raters.

Having been randomly assigned to one of two treatment conditions, each subject participated in one, two or three sessions with a therapist, engaged in individual treatment using either EMDR or structured writing to address post-traumatic symptoms associated with the traumatic event identified by each subject as the worst experience. Sessions were scheduled to last approximately one hour. Although subjects were given a maximum of three treatment sessions, the treatment was terminated earlier if scores on the SUDS and VoC scales met criteria to do so.

Subjects assigned to the private writing condition were taken to a private therapy room, and prior to writing, they were asked to visualize the event, label it, and then rate their level of distress regarding the traumatic event using the SUDS. Then they were asked to identify a present cognition associated with the event and
subsequently to identify a cognition they would like to believe concerning the traumatic event. They were asked to rate this last statement regarding its believability according to the Validity of Cognitions Scale. They were given paper and pen and instructed to write about the traumatic event to include a narrative of the events which occurred, as well as the cognitions, emotions and sensory (physiologic) responses associated with the trauma. They were interrupted at approximate 15-minute intervals during the one-hour session, and asked to rate current responses according to the SUDS scale. At the conclusion of the session, they were again asked to rate the event according to the SUDS, and the cognitive statement according to the Validity of Cognitions Scale. Finally, their writings were collected and placed in a confidential file. A coding system for further analysis of this information could be developed to include such factors as the degree to which the individual wrote about all aspects of the traumatic event and to assess the degree of emotionality and organization of the writings.

Similarly, subjects assigned to the EMDR condition were scheduled for one, two, or three, one-hour sessions to be conducted at the WMU Psychology Clinic. They received treatment according to the standard EMDR protocol, and like their counterparts in the writing treatment, began treatment sessions by visualizing the event, labeling it, and rating their level of distress regarding the traumatic event using the SUDS. They were asked to identify a present cognition associated with the event and subsequently to identify a cognition they would like to believe concerning the traumatic event and provide ratings using the Validity of Cognitions Scale and SUDS scale.

The two treatments were similar in many respects. Both treatments began with an explanation of the treatment and the rationale for that treatment by the therapist. The therapist remained with the subject in both treatment modalities, periodically asking the subject to provide ratings, and redirecting the subject to focus on the cognitive, emotional, and sensory aspects of the traumatic event. Subjects receiving EMDR
treatment, were asked to focus on cognitive, narrative, emotional, and sensory aspects of the trauma while moving the eyes in saccadic movements, while subjects receiving structured writing treatment, were asked to focus on the same aspects of the trauma while writing their thoughts on paper in the presence of the therapist.

The procedures for the treatment sessions, and criteria for termination before the conclusion of the third treatment session varied with the two types of treatment. Subjects receiving EMDR were asked to focus on the traumatic event and "whatever else came up" after each set of saccadic eye movements, until two consecutive SUDS ratings were low (zero, one or two). At this point the subject's attention was focused on the cognitions associated with the event, and EMDR was continued until two consecutive scores on the VoC scale were high (six or seven). Treatment was terminated when these criteria were met.

The procedure used for the structured writing sessions was slightly different. Subjects were asked to focus on the traumatic event as with the EMDR treatment, but VoC scores were taken only at the beginning and end of each session. Criteria for termination was independent of the VoC scores, consisting only of two consecutive low SUDS ratings (zero, one or two). Subjects in the structured writing treatment were not asked to address the cognitive aspects of their traumatic experience specifically, nor were scores reflecting change in this area used as criteria for treatment termination.

Post-test sessions were scheduled one to two weeks after the last treatment session, although in actuality, with constraints of scheduling, missed appointments and unexpected events, many post-tests were conducted considerably later. Follow-up sessions were scheduled on a date about one month after the post-test session, but again scheduling constraints and missed appointments resulted in many follow-ups being conducted several months after treatment was concluded.
All subjects completed the Impact of Events Scale (IES) (Horowitz et al., 1979) and Treatment Efficacy Expectancy Scale (TEES) prior to treatment, at post-test and at follow-up sessions. In addition, all subjects were asked to complete the "state" portion of the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983), prior to commencing treatment at the beginning of the first treatment session, at the conclusion of each treatment session, at post-test and at follow-up. Subjects completed the Symptom Checklist - 90 - Revised (SCL-90-R) (Derogatis, 1975b) at intake, post-test and follow-up sessions.

Confidentiality and Subjects' Rights

Subjects were advised concerning confidentiality in the first session. Before the initial screening session began each subject was informed concerning the nature of the study, and was asked to sign an informed consent form which outlined the risks and benefits of participation in the study. (See Appendix B.) Explanations were provided concerning the time frames expected for taking part in the study, both in terms of the time commitment expected on a weekly basis and in terms of the number of weeks of participation required to fully participate in the study. Subjects participated voluntarily. Although individuals were encouraged during the initial screening session to participate for the duration of the study, they could withdraw at any time without recrimination. This information was noted on the consent form.

Data were collected and maintained for each subject individually. Subjects were assigned numbers for the purposes of data collection, and materials were labeled using experimental numbers rather than names and stored in a locked cabinet in the Psychology Clinic at Western Michigan University. The master list of subject names, treatment group assignment, and corresponding subject numbers was stored separately in a locked file at the Psychology Clinic at Western Michigan University. Dr. Richard

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Tsegaye-Spates, Lisa Largo, others who use the clinic (graduate students or researchers in clinical psychology), and clinic staff could access these materials.

For purposes of the research, data were analyzed and presented primarily in group form, although individual data may be presented without the use of names, in a manner in which not even the individual could identify herself. After completion of the research, all data collected during the course of the study will be stored in a locked room for a five-year period, after which the information will be destroyed by paper shredding.
RESULTS

Preliminary Data Analyses

Subject Demographics

Thirty-seven individuals were screened for participation, but ten did not meet the criteria to take part in the study. These individuals were excluded for obsessive compulsive characteristics (N = 3), paranoid schizophrenia (N = 1), psychosis (N = 1), severe dissociative symptoms and likely borderline personality disorder (N = 1), instability and likely borderline personality disorder (N = 1), antisocial personality disorder (N = 1), significant depressive symptoms which were deemed to put the individual at risk (N = 1), and not meeting inclusion criteria for post-traumatic stress disorder, but rather experiencing symptoms of night terrors (N = 1). Subjects excluded from the study were referred to other mental health treatment providers, or given a list of names of available resources to meet their needs.

Intake interviews were conducted with 37 interested participants, 27 of whom met criteria for participation. Three of the 27 qualifying individuals dropped out, or for other reasons did not complete the study, resulting in 24 individuals who completed the study and whose data is available for analysis. Two women and one man dropped out of the study. One individual chose to drop out of the study after the intake session and before the hypnotizability session, expressing a reluctance to be hypnotized. Another chose to no longer participate, saying that he felt he would not be a good subject. The third was unable to complete the study due to a busy and chaotic lifestyle which made it difficult to contact her by phone and scheduled appointments were frequently missed.
Of the 24 individuals who completed the study, there were seventeen women and seven men. Twenty-one were Caucasian, two were Hispanic and one was of Asian descent. They ranged in age from 18 to 61 years of age, with a mean age of 34 years. Educational levels ranged from a high school education to those having obtained master's degrees, with an average educational level equivalent of two years of college. Twelve subjects were married, seven single and five divorced or separated.

These demographic variables were distributed comparably among the two treatment groups using the random assignment procedure. Mean ages of the EMDR and writing subjects were 35.7 and 33.9, respectively. Ages ranged from 18 - 49 for those in EMDR treatment and 19 - 61 for those in the writing treatment. Mean educational levels of the two treatment groups were 14.3 (EMDR) and 14 (writing). Seven men completed the study, of these two were treated with EMDR while five were assigned to the writing condition.

Diagnostic Information

Within the constraints of the structured interview format of the C-DIS, subjects were able to identify and describe symptoms associated with up to three traumatic events. Each subject was asked to identify and rate traumatic experiences beginning with the most disturbing event, if indeed more than one had been experienced. The worst traumatic experiences designated by the 24 subjects included rape or molestation (N = 5), injury or accident (N = 4), physical assault (N = 3), seeing someone hurt / killed (N = 3), news of sudden death (N = 1), ambulance call where four young people and an infant were found dead (N = 2), house fire in which all possessions were destroyed, son was injured and three cats killed (N = 2), murder of co-worker on the job (N = 1), search and rescue in the military (N = 1), sudden onset and diagnosis of
multiple sclerosis (N = 1), and simultaneous divorce, business failure, and bankruptcy (N = 1).

At the time of intake 18 of 24 subjects (75%) met DSM-IV criteria for PTSD (American Psychiatric Association, 1994) for at least one of their traumatic experiences. (See Table 1.) Six subjects did not meet DSM-IV diagnostic criteria for PTSD, but they did meet criteria for participation in the study. They had experienced a traumatic event as outlined in the DSM-IV criteria for PTSD, category A) a traumatic experience involving threatened death or serious injury and intense fear, helplessness or horror. Additionally, they reported experiencing some post-traumatic symptoms. Specifically, all six subjects reported symptoms associated with category B) persistent re-experiencing of the event (intrusive thoughts, recurrent dreams, flashbacks). Five of the six subjects endorsed symptoms associated with category C) persistent avoidance of stimuli associated with the traumatic event (avoidance of associated thoughts, activities and situations, psychogenic amnesia, diminished interest in activities, feelings of detachment, restricted range of affect, and a sense of a foreshortened future). Likewise, five of six subjects endorsed symptoms associated with category D) persistent symptoms of increased arousal (sleep disturbance, irritability, difficulty concentrating, hypervigilence, exaggerated startle response, physiologic reactivity to stimuli associated with traumatic event). Four of the six subjects reported symptoms from all three symptom categories (intrusive, avoidant and hyperarousal symptoms). Two of these six subjects reported symptoms within only two of the symptom categories. Five of the six subjects not meeting full criteria for PTSD met the criterion for category E) duration of the disturbance of at least one month. One subject had been in a series of vehicular accidents, the last of which occurred about four weeks prior to intake. Although he had not yet had symptoms for the duration of one month since this accident, the multiple events and symptoms reported within the last four weeks.
suggested it was not unreasonable to assume that he would shortly meet the duration criterion. All subjects met the criterion for F) the disturbance caused clinically significant distress.

Eight subjects reported only one traumatic event, and of these five met DSM-IV diagnostic criteria for PTSD. Eight subjects also reported two traumata of which two met DSM-IV criteria for one event and four met criteria for both events. Lastly, nine subjects reported three traumata of which one subject met criteria for one event and three subjects met criteria on all three events. In sum, six subjects had only some PTSD symptoms, but did not meet full criteria for the diagnosis, ten subjects met criteria for one traumatic experience, five met criteria for two traumatic experiences, and three met criteria for all three allowable traumatic experiences. (See Table 1.)

Table 1
Post-Traumatic Symptomology and Treatment Assignment of Subjects

<table>
<thead>
<tr>
<th>Severity of Reported PTSD Symptoms at Intake</th>
<th>EMDR</th>
<th>Writing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD Criteria Not Met on Any Reported Traumata</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Diagnostic Criteria for PTSD met for only 1 Trauma</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Diagnostic Criteria for PTSD met for 2 Traumata</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Diagnostic Criteria for PTSD met for 3 Traumata</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Overall this pool of subjects evidenced less symptomology than those included in some other studies of PTSD treatments. Of the 24 subjects completing the study, 16 met criteria on only one event or did not meet full criteria for PTSD diagnosis. Only eight subjects met criteria on two or three traumatic events. This may have been due to
two factors. First, individuals with more complex histories and more severe psychopathology were screened out during the intake process. In addition, several individuals who expressed interest in the study chose not to participate. For example, two Vietnam veterans, both of whom had been suffering from severe symptoms for almost twenty years, expressed reservation and fear regarding leaving their homes and participating in the treatment protocols.

Subjects each received one, two, or three treatment sessions depending on how rapidly criteria for the termination of treatment was reached. Six subjects received only one treatment session, six subjects received only two treatment sessions, and twelve subjects received three treatment sessions. The mean number of treatment sessions for all subjects was 2.25, and the mean number of treatment sessions for subjects assigned to the two treatment protocols were 2.083 (EMDR) and 2.417 (structured writing sessions).

We provided a maximum of three treatment sessions, and only addressed one traumatic event for each individual in this study. Generally there may be a tendency for individuals with several traumatic events, and presumably more complex trauma histories, to require more treatment sessions in order to address their post-traumatic symptomology. Although this pattern is not conspicuously substantiated by this data, subjects reporting two or three qualifying traumata required at least two, and often three treatment sessions to meet the treatment termination criteria. (See Table 2.) The relationship between severity of traumatic experience and the number of treatment sessions required to ameliorate symptoms would be more clear had we provided an unlimited number of sessions, and had we treated all traumatic events, rather than addressing only a singular event identified by the individual as the most troubling at the time of treatment.
<table>
<thead>
<tr>
<th>Traumata</th>
<th>1 Session</th>
<th>2 Sessions</th>
<th>3 Sessions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 (17%)</td>
<td>2 (33%)</td>
<td>3 (50%)</td>
<td>6 (25%)</td>
</tr>
<tr>
<td>1</td>
<td>5 (50%)</td>
<td>1 (10%)</td>
<td>4 (40%)</td>
<td>10 (42%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0%)</td>
<td>3 (60%)</td>
<td>2 (40%)</td>
<td>5 (21%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
<td>3 (12%)</td>
</tr>
<tr>
<td>Total</td>
<td>6 (25%)</td>
<td>6 (25%)</td>
<td>12 (50%)</td>
<td>24 (100%)</td>
</tr>
</tbody>
</table>

$p = 0.097$

Anecdotal Reports

Anecdotal evidence from subjects during follow-up produced some interesting information as well. With one exception (a writing subject) all subjects indicated that they found the treatments helpful for their problems. When offered the treatment not received during the course of the study, only one individual requested to receive such treatment. She had been referred to the study originally by her therapist because of the EMDR component of the research, yet had been assigned to the writing condition. A number of subjects indicated surprise regarding how effective relatively simple treatments had been for them, suggesting at follow-up that they had initially been quite skeptical but were pleased with the treatments' effects. Several subjects in the writing
condition mentioned that they felt that they had learned a new skill during the treatment sessions, and that they could now apply this writing technique independently with other problems as they arose.

One EMDR subject had been unable to attend the scheduled one-month follow-up session, and was eventually scheduled three months after the conclusion of treatment. She stated that she had had excellent results from the treatment at first, and that if we had conducted the follow-up as scheduled she would have reported virtually no symptoms, however, she had had a sudden resurgence of many of the symptoms about two months after treatment ended. Nonetheless, her follow-up scores indicated reduced symptomology relative to intake.

Data Analyses

Eighteen of 24 subjects (75%) who completed the study met criteria for PTSD at intake, but at follow-up only 15 of 23 (65%) met criteria for PTSD. Of those meeting PTSD criteria at follow-up nine (60%) had been assigned to EMDR and six (40%) had received structured writing treatment. (Erroneously, one subject who had been assigned to EMDR treatment was not administered the C-DIS at follow-up, and therefore data is not available on this measure regarding this particular subject.)

Eleven of the subjects assigned to the EMDR condition met diagnostic criteria for PTSD at intake, included six meeting criteria for one event, three for two events and two for three events. At follow-up two no longer met diagnostic criteria at all, four met criteria for only one event, two met criteria for two events, and three met criteria for three events. (One individual reported three traumatic events at intake one of which met criteria for PTSD, then subsequently at follow-up all three traumata met criteria.) Of the EMDR subjects meeting criteria for one event 33% improved at follow-up as they no longer met criteria for the diagnosis. Of the three EMDR subjects meeting criteria
for two events, one remained unchanged at follow-up, one met criteria for one traumatic event, and one met criteria for three traumatic events at follow-up. The EMDR subjects who met criteria for three events at intake, continued to meet criteria for three events at follow-up. Overall, the data from this research does not support the conclusion that those with more complex trauma histories require more extensive treatment in order to effectively address their post-traumatic symptoms. (See Table 3.)

Table 3
Post-Traumatic Symptomology at Intake and Follow-Up Assessments

<table>
<thead>
<tr>
<th>Severity of Reported PTSD Symptoms</th>
<th>Subjects at Intake</th>
<th>Subjects at Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EMDR</td>
<td>Writing</td>
</tr>
<tr>
<td>PTSD Criteria Not Met on Any Traumata</td>
<td>1 (8%)</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>Diagnostic Criteria met for only 1 Trauma</td>
<td>6 (50%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>Diagnostic Criteria met for 2 Traumata</td>
<td>3 (25%)</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>Diagnostic Criteria met for 3 Traumata</td>
<td>2* (17%)</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Total Subjects</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Legend. This table depicts the assignment of subjects to treatment groups and the number of reported traumata meeting DSM-IV criteria for each subject at intake and follow-up assessments.

*One subject was not administered the C-DIS at follow-up.
A correlation coefficient was computed using the number of traumatic events meeting DSM-IV criteria for PTSD at intake and the number of treatment sessions provided ($r^2 = .062$), which further substantiates the zero-order relationship between these variables. In order to further evaluate this relationship between the number of traumatic events meeting DSM-IV criteria for PTSD and the effectiveness of treatment, correlation coefficients were also computed using the number of qualifying traumata and the change scores from pre-test to follow-up on the Impact of Events (IES) intrusion scores ($r^2 = .037$), Impact of Events (IES) avoidance scores ($r^2 = .016$), SCL-90-R anxiety subscale scores ($r^2 = .196$), and State-Trait Anxiety Inventory Scores ($r^2 = .047$). Again only zero-order relationships exist between these variables.

Of the subjects assigned to the writing condition seven of twelve subjects (58%) met diagnostic criteria for PTSD at intake. Five subjects did not meet diagnostic criteria, four subjects met criteria for one event, two subjects met criteria two events and one subject for three events. At follow-up six of the subjects assigned to the writing condition did not meet diagnostic criteria for PTSD, six subjects met criteria for only one event, and none met criteria for two or three events. Of the writing subjects meeting criteria for one event at intake only one of the four (25%) improved at follow-up, no longer meeting criteria for the diagnosis. (The other three remained unchanged on this measure.) Both of the two writing subjects who met criteria for two events at intake improved at follow-up. One met criteria for one traumatic event and the other met criteria for no events at follow-up. The writing subject who met criteria for three events at intake, also improved, meeting criteria for only one event at follow-up. In sum, subjects in the writing condition tended to evidence reductions in reported symptomology regardless of its severity.

Initially, ANOVA was performed on the data for the two treatment groups to verify that statistically significant differences did not exist between the two groups.
before treatment for the following standardized outcome measures: SCL-90-R (p=.7867), STAI (p=.7289), IES Avoidance scores (p=.1675) and IES intrusion scores (p=.1022). Although the EMDR subjects had a higher mean intrusion score on the IES (2.107) than did the writing subjects (1.655), this difference did not attain statistical significance. Additionally, no statistically significant differences were found on the Treatment Efficacy Expectancy Scale (p=.8126), nor on the number of traumata meeting DSM criteria at intake for the two treatment groups (p=.1474).

A two factor group (with EMDR and structured writing as the independent variables) by assessment phase ANOVA with repeated measures was used to evaluate differences between the two groups at pre-test, post-test and follow-up on the IES intrusion and avoidance scores, STAI, and SCL-90-R anxiety subscale scores. VoC and SUDs scores were considered process measures and they were not subjected to ANOVA analysis, as they are an inherent part of the treatment protocol and were not administered outside of the treatment sessions. Correlation coefficients were calculated to evaluate the relationship between scores on expectancy and hypnotizability measures with treatment outcome. Due to scheduling constraints two subjects had not been administered post-tests assessments, and due to error, one subject had not been administered the State-Trait Anxiety Inventory at post-test. In order to perform the ANOVA analyses, the means for the treatment groups were substituted for this missing data for the relevant measures.

**Symptom Checklist - 90 - R (SCL-90-R) Anxiety Subscale**

Figure 1 depicts the mean scores obtained by subjects in each of the two treatment groups on the anxiety subscale of the SCL-90-R. Both groups reported reductions in anxiety at post-test, however those in the writing condition tended to
continue to report reductions at follow-up, while subjects in the EMDR condition had a slight resurgence of symptoms at follow-up.

![SCL-90-R Anxiety Subscale Means](image)

Figure 1. SCL-90-R Anxiety Subscale Means.

In order to evaluate the comparative effectiveness of the two treatment protocols, a two factor group by assessment phases ANOVA with repeated measures was performed for the scores on the SCL-90-R (anxiety subscale). (See Table 4.) The results of this analysis suggest that while there are significant differences (at the 95% confidence level) for all subjects between phases of treatment ($F = 5.001; p = .011$), there are no significant differences between the treatment groups ($F = .166; p = .6877$).
Table 4
Repeated Measures ANOVA for Symptom Checklist - 90 - R (Anxiety Subscale)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group (A)</td>
<td>1</td>
<td>.346</td>
<td>.346</td>
<td>.166</td>
<td>.6877</td>
</tr>
<tr>
<td>Within Group</td>
<td>22</td>
<td>45.813</td>
<td>2.082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeated Measures (B)</td>
<td>2</td>
<td>3.239</td>
<td>1.619</td>
<td>5.001</td>
<td>.011</td>
</tr>
<tr>
<td>AB</td>
<td>2</td>
<td>.063</td>
<td>.031</td>
<td>.097</td>
<td>.9079</td>
</tr>
<tr>
<td>B X Within Group</td>
<td>44</td>
<td>14.246</td>
<td>.324</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impact of Events Scale (IES)

Intrusion scores on the IES are depicted graphically in Figure 2. Visual inspection confirms the trend toward lessening of these symptoms, as expected. In order to evaluate the comparative effectiveness of the two treatment protocols, a two factor group by assessment phases ANOVA with repeated measures was performed for the intrusion scores on the IES. The results of this analysis suggest significant differences (p < .05) for all subjects between phases of treatment (F = 31.672; p = .0001), but no significant differences between the treatment groups (F = 1.584; p = .2214). (See Table 5.)

Avoidance scores on the IES are depicted in Figure 3. Visual inspection confirms the trend toward lessening of symptoms. A two factor group by assessment phases ANOVA with repeated measures was performed for the avoidance scores on the IES. The results of this analysis suggest that there are significant differences (p < .05) for all subjects between phases of treatment (F = 11.253; p = .0001), but no significant differences between the treatment groups (F = .943; p = .342). (See Table 6.)
Figure 2. Impact of Events Scale Mean Intrusion Scores.

Table 5
Repeated Measures ANOVA for Impact of Events Scale Intrusion Scores

<table>
<thead>
<tr>
<th>Source</th>
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<th>SS</th>
<th>MS</th>
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<tr>
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<td>44</td>
<td>7.516</td>
<td>.171</td>
<td></td>
<td></td>
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</tbody>
</table>

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Figure 3. Impact of Events Scale Mean Avoidance Scores.

Table 6
Repeated Measures ANOVA for Impact of Events Scale, Avoidance Scores

<table>
<thead>
<tr>
<th>Source</th>
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<td>10.256</td>
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</table>
State-Trait Anxiety Inventory (State Portion)

Figure 4 depicts the trends for the two treatment groups on the State-Trait Anxiety Inventory (STAI) (State Portion). Again, one notes the general trend toward a reduction of symptoms. The comparative effectiveness of the two treatment protocols was evaluated using a two factor group by assessment phases ANOVA with repeated measures for the STAI scores at pre-treatment, post-test and follow-up. The statistical analysis revealed significant differences ($p < .05$) for all subjects between phases of treatment ($F = 1.404; p = .0016$), but no significant differences between the treatment groups ($F = .039; p = .8459$). See Table 7.

![State-Trait Anxiety Mean Scores (State Portion)](image)
Table 7
Repeted Measures ANOVA for State-Trait Anxiety Scores (State Portion)

<table>
<thead>
<tr>
<th>Source</th>
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<td>B X Within Group</td>
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<td>7.754</td>
<td>.176</td>
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</tr>
</tbody>
</table>

Subjective Units of Distress (SUDs)

SUDs scores were collected at approximate 15-minute intervals during all treatment sessions. SUDs scores taken at the beginning and end of each treatment session are presented graphically in Figure 5. Comparisons between sessions are limited because the number of subjects receiving one, two or three treatment sessions varied considerably with the more persistent cases receiving two or three sessions. The patterns of SUDs scores within all treatment sessions for the two groups are depicted graphically in Figure 6. Evident reductions during treatment sessions are apparent in SUDs scores for both treatment groups, although the EMDR subjects tended to report more dramatic, earlier reductions, and the writing subjects more gradual reductions.
Figure 5. Mean SUDs Scores for Treatment Groups During Treatment Sessions.

Figure 6. Mean SUDs Scores Within Treatment Sessions.

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Validity of Cognition Scores (VoC)

The means for the two groups for VoC scores taken at the beginning and end of each treatment session are presented graphically in Figure 7. Increases in VoC scores during treatment sessions are evidenced for both treatment groups. Increasing scores on this measure indicate beneficial treatment effects, reflecting a firmer belief in the desired cognitions. Patterns between sessions should be regarded with some caution, as the number of subjects receiving one, two or three treatment sessions varied and the procedures used for termination of sessions differed for the two types of treatment. (The EMDR subjects had to report high VoC scores in order for treatment to be terminated, while those in the writing treatment simply provided VoC scores at the end of the sessions.)

![Figure 7. Mean VoC Scores for Treatment Groups During Treatment Sessions.](image-url)
Hypnotic Susceptibility

Correlation coefficients were calculated to determine the relationship between hypnotic susceptibility (as measured using the Stanford Hypnotic Susceptibility Scale) and treatment outcomes. This statistic was calculated for all subjects based on change scores from pre-test to follow-up for the following outcome measures: IES intrusion \( (r^2 = .000046) \), IES avoidance \( (r^2 = .001) \), SCL-90-R anxiety subscale \( (r^2 = .005) \), and STAI \( (r^2 = .149) \). Similar analysis was performed for the EMDR treated subjects: IES intrusion \( (r^2 = .082) \), IES avoidance \( (r^2 = .041) \), SCL-90-R anxiety subscale \( (r^2 = .054) \), and STAI \( (r^2 = .041) \) and for subjects receiving writing treatment: IES intrusion \( (r^2 = .116) \), IES avoidance \( (r^2 = .048) \), SCL-90-R anxiety subscale \( (r^2 = .063) \), and STAI \( (r^2 = .306) \). These values indicate that only zero-order relationships exist among these variables.

Expectancy Variables

Figure 8 depicts the mean scores on the Treatment Efficacy Expectancy Scale for the two treatment groups. Generally there was a trend to report increased confidence in the treatments' effectiveness as the symptoms improved. Of note is the differences between the two groups occurring between post-test and follow-up. While the EMDR subjects tended to continue to report increased confidence in the treatment's effectiveness, the writing subjects reported less confidence in treatment efficacy at follow-up.

Correlation coefficients were calculated for all subjects based on change scores from pre-test to follow-up for the following outcome measures: IES intrusion \( (r^2 = .075) \), IES avoidance \( (r^2 = .029) \), SCL-90-R anxiety subscale \( (r^2 = .042) \), and STAI \( (r^2 = .001) \). Similar analysis was performed for the EMDR treated subjects and the
following values obtained: IES intrusion ($r^2 = .257$), IES avoidance ($r^2 = .027$), SCL-90-R anxiety subscale ($r^2 = .129$), and STAI ($r^2 = .003$). Analysis of the scores for writing subjects resulted in the following values: IES intrusion ($r^2 = .00048$), IES avoidance ($r^2 = .029$), SCL-90-R anxiety subscale ($r^2 = .001$), and STAI ($r^2 = .000045$). Again, these data reveal very low or zero-order relationships among these variables.

![Figure 8. Treatment Efficacy Expectancy Mean Scores for Treatment Groups.](image)
DISCUSSION

Comments on the Outcomes of This Research

Treatment Effectiveness

Although the population of participants was heterogeneous in terms of categories of traumatic experiences and severity of pathology, the results of this study support the overall efficacy of the EMDR and structured writing protocols in reducing the intensity of post-traumatic symptoms within a relatively short and focused treatment context. Although shortly after Shapiro's initial research (1989a, 1989b) it seemed as though the eye movements might be essential to the effectiveness of the EMDR procedure, the data support that of other studies which have found treatments using alternatives to the rapid eye movements to be equally effective (Bauman and Melnyk, 1994; Cocco and Sharpe, 1993; Foley and Spates, in press; Gosselin and Matthews, 1995; Renfrey and Spates, 1994). These studies have evaluated the effectiveness of protocols which replace the eye movement component of EMDR with other activities, including focusing on a stationary target or not moving the eyes (Foley and Spates, 1996; Gosselin and Matthews, 1995; Renfrey and Spates, 1994), attending to finger clicking sounds in alternate ears (Cocco and Sharpe, 1993), and finger tapping with alternate hands (Bauman and Melnyk, 1994). This research contributes to the list, suggesting that writing about all aspects of a traumatic event may be yet another alternative to the eye movement component of the EMDR protocol. This research also supports Pennybaker's (1993) findings that writing can be therapeutic, especially when all aspects of the experience are addressed.

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If exposure to all aspects of a traumatic experience contribute to the effectiveness of an exposure procedure, the use of differing instructions regarding the exposure or re-experiencing component of the treatment may be partly responsible for the apparent superiority of EMD in Shapiro's (1989a, 1989b) original research. Shapiro (1989a, 1989b) describes the protocols used for the treatment and control groups in her initial study of EMD. She provided different instructions to the two groups regarding how to re-experience the traumatic event, instructing the EMDR subjects to attend to all aspects of the trauma, but asking the exposure control subjects to simply describe what happened. In so doing, she may have inadvertently used quite different exposure procedures, which may have been partly responsible for the apparent superiority of the EMD protocol. The results of our research suggest that exposure to all aspects of the trauma may be critical.

Consistent patterns of symptom reduction were noted for both treatment groups on the standardized outcome measures. Generally the trend for the EMDR treatment could be summarized as evidencing a statistically significant reduction in the severity of symptoms after treatment (pre-test to post-test differences) which were largely maintained at follow-up. On some instruments, some resurgence of symptoms occurred between the post-test and follow-up sessions, although this difference was not statistically significant and the benefits of treatment were substantially maintained. The trend for the structured writing treatment could be summarized as evidencing a somewhat slower and more gradual reduction in the severity of symptoms after treatment (pre-test to post-test differences) with a continued reduction in symptoms between the post-test and follow-up sessions. Intrusive and avoidant symptoms as measured on the Impact of Events Scale (IES), anxiety as measured on the Symptom Checklist-90-R (SCL-90-R), and on the state portion of the State-Trait Anxiety Inventory (STAI) were consistently reduced over the course of the study. Overall, the
data suggest that both treatments were effective in reducing reported symptoms with the
gains being largely maintained at follow-up.

The Computerized Diagnostic Interview Schedule (C-DIS) was used to evaluate
post-traumatic symptomology at the time of intake and again at follow-up. Although
75% of subjects met criteria for PTSD at intake fewer (65%) met criteria at follow-up.
These figures suggest overall improvement in symptomology. Most of these
individuals would not be considered cured of their symptoms. Nonetheless, the
treatment effects may have been more beneficial than these figures suggest. Even
though individuals may have met diagnostic criteria for PTSD at follow-up, the severity
and frequency of symptoms may have been reduced to a more tolerable level. In
addition, it should be noted that the C-DIS is not designed to be used as a treatment
outcome or change measure, and as such may not be sensitive to symptom change
between pre-treatment and post-treatment assessments.

Contrary to expectations, the individuals found to have the best response to
treatment were not necessarily those with less pathology, fewer traumatic experiences
and less complicated trauma histories. Of the six individuals not meeting DSM criteria
for PTSD at follow-up, three had not met criteria at intake, and had been assigned to the
writing treatment. Two others had met criteria for PTSD on one event at intake and had
been assigned to EMDR treatment. One had met criteria for one event at intake and had
been assigned to the writing treatment. Unlike some other studies in which dramatic
results were claimed in a few EMDR treatment sessions (Marquis, 1991; Shapiro,
1989a, 1989b), no dramatic cures of complicated cases were noted in this study. No
one entering the study who met DSM criteria for PTSD on more than one event was
found to no longer meet diagnostic criteria at follow-up. Further systematic and
experimental research may be needed to clarify what outcomes might be realistically
expected with specific PTSD symptom profiles. Subject characteristics such as the type
of traumatic experience(s), diagnosis, co-morbid conditions, length of time since trauma, and number of traumatic experiences should be systematically assessed. Then, clinicians and researchers using EMDR might have more realistic expectations for treatment outcome, including how rapidly and how completely symptoms might be expected to abate.

Scores on the State-Trait Anxiety Inventory (STAI) provide additional information regarding the subjects' subjective reports of physiological arousal over the course of the first treatment session and over the course of the study overall. Although overall the subjects evidenced a reduction in reported symptoms at follow-up, the patterns differ for the two treatment groups. Pennybaker (1992) found that correlates of physiological arousal (blood pressure and heart rate) were elevated at the conclusion of a session spent writing about a disturbing event. Although physiological measures were not assessed in this study, scores on the State-Trait Anxiety Inventory (STAI) would be expected to correlate with physiological measures and similarly reflect arousal levels. Consistent with Pennybaker's findings, many subjects evidenced greater arousal levels at the conclusion of the writing sessions, as can be seen by comparing State-Trait Anxiety Inventory (STAI) scores at the beginning and end of the first treatment session for the writing subjects. Many EMDR subjects evidenced the reverse pattern, their scores tended to be reduced at the conclusion of the first session. EMDR may tend to increase and then decrease arousal levels sooner than the writing treatment, although both appear to reduce arousal effectively over a longer period of time.

Another difference noted in the pattern of State-Trait Anxiety Inventory (STAI) scores for the two groups is apparent in the trends between post-test and follow-up assessments. The EMDR group tended to evidence a small characteristic increase in reported symptoms, while the writing subjects continued to improve during this period of time. Perhaps the continued improvement evidenced by the writing group occurred
because this treatment tended to have slow and gradual effects. Barlow (1988) suggests that the addition of a cognitive intervention to an exposure treatment for other anxiety disorders contributes to the maintenance of treatment gains. It is possible that the writing intervention included a more substantial or effective cognitive component than did the EMDR protocol. The writing subjects may have achieved greater cognitive mastery over their traumatic histories, and the addition, although inadvertent, of a more effective cognitive re-structuring component may have enhanced the maintenance of the treatment effects. These apparent trends raise questions, and further research is needed to replicate this phenomenon and explain any differences in apparent trends.

SUDS and VoC scores constituted process variables within the treatment sessions. These measures suggest information about the subjects' experiences within the sessions themselves. SUDs scores during treatment sessions for both treatment groups suggest a tendency for subjects to report decreases in subjective distress over the course of a given treatment session. There is a general trend for both EMDR and writing subjects toward reduction in SUDs scores within each session as treatment progresses. Therapists of both treatments reported that often subjects seemed to experience an increase in arousal (and report higher SUDs scores) in the earlier stages of the session, although this process tended to be more dramatic and occur sooner in the EMDR sessions. One would expect physiological arousal to increase as one confronted the thoughts, feelings and images associated with a traumatic experience. Unfortunately, SUDs scores were collected at approximate 15 minute intervals so more detailed information about the pattern is not available from this data. The graphic representation of the SUDs scores within treatment sessions supports this general trend, however.

VoC scores, depicted graphically for the two groups, reflect anticipated trends as well. On the average, subjects in both groups reported increases in VoC scores...
during the treatment sessions. However, conclusions regarding the comparative effectiveness of the two treatments can not be made based on these scores because only EMDR subjects had to continue with treatment until two consecutive VoC scores of six or seven were reported or the third treatment session ended. High VoC scores were not criteria for the termination of treatment for the writing group.

**Comparative Effectiveness of the Two Treatments**

The results suggest that both of the treatment protocols used in this research were effective in reducing the symptomology associated with post traumatic stress disorder, and that the two treatments were statistically indistinguishable from each other in terms of effectiveness. Due to the relatively small sample size of this study, however, a true difference in effectiveness between the two treatments may not have been noted. Although, statistically the treatments were judged to be comparable, there may be advantages to the EMDR procedure that merit further exploration. Overall the EMDR subjects tended to require fewer sessions despite the fact that as a group they were more symptomatic than their writing counterparts. This suggests that while the treatment outcomes may be comparable, amelioration of symptoms was achieved more rapidly with the EMDR procedure. These trends were also noted within treatment sessions, as the SUDs levels tended to rise more quickly and then more readily reach a reduced level with the EMDR subjects.

While there may be advantages to EMDR regarding the rapid reduction of affect associated with the traumatic event, the writing protocol has some advantages as well. First it is a technique which lends itself to use outside of treatment sessions, and as such might be used as an effective adjunct to other treatment methods. Secondly, once instructed in the procedures, subjects indicated they felt that they had learned a useful new skill, which might be applied independently in the future as needed. Lastly, the
procedure may tend to reduce symptoms gradually over a longer period of time, and the therapeutic effect may tend to be maintained or enhanced after the conclusion of treatment. It may be that combinations of treatments such as the EMDR and structured writing procedures result in superior results than would either alone. This again remains for future research to explore.

**Factors Contributing to Treatment Efficacy**

Despite its name and apparent simplicity, the EMDR protocol has many components which are likely to contribute to the effectiveness of the procedure. These components include procedures similar to thought stopping treatments (repeatedly recalling and blanking out the image), relaxation and self-control strategies (a deep breath at the end of each set of saccadic eye movements), exposure (including exposure to aversive trauma related imagery and cognitions, and instructions to focus on all aspects of the experience including cognitive, sensory, affective and imaginal aspects), and cognitive restructuring (discussion with the therapist and identification of trauma-related cognitions and rehearsal of adaptive cognitions). In addition the EMDR procedure has several unique elements which may contribute to its effectiveness including the rapid eye movements, the free-flowing nature of the treatment process, the intensely focused nature of the treatment, and the close physical proximity of the therapist during the procedure.

Our structured writing procedures were effective in reducing post-traumatic symptoms and were statistically indistinguishable from the EMDR treatment in this regard. This may be due to several elements the two treatments had in common, although the contribution of the various components remains unclear. The writing sessions contained several elements in common with EMDR sessions.
1. The initial cognitive restructuring component of the EMDR treatment protocol was in place. During the initial part of the session writing subjects spent considerable time discussing present and desired cognitions, as well as providing ratings on the SUDs and VoC scales before they commenced writing.

2. Most of the treatment session involved exposure to traumatic imagery with instructions to focus on cognitive, affective, and sensory elements of the experience.

3. For the most part, the free-flowing nature of the treatment was maintained. Although subjects were instructed to write about all aspects of their experience, they were encouraged to do so without regard to spelling, grammar, handwriting, or organization. However, unlike the EMDR subjects, the writing subjects were not instructed to "let the process happen" nor were they given the expectation that "sometimes the images and thoughts might change and sometimes they might not."

4. Like the EMDR subjects, the writing subjects were not allowed to avoid traumatic material for long. Writing subjects were expected to continue to write about the traumatic experiences between short breaks provided at 15 minute intervals during the sessions. During these breaks they provided SUDs scores, the therapist read the last paragraphs written, and then they were instructed to continue to write about all aspects of their experiences. Thus they were repeatedly re-directed to focus on the traumatic events during sessions, with only brief, periodic interludes between periods of exposure to the traumatic material.

5. Both treatments were unusual in that they involved minimal interaction with the therapist, a characteristic which sets both apart from traditional therapies.

The comparative effectiveness of the two protocols suggests that many of their common features may be responsible for their effectiveness. Both include exposure to stimuli associated with the traumatic experience, including an emphasis on all aspects of this experience, and both protocols contain a cognitive component as present and
desired cognitions are discussed with subjects. Unfortunately no firm conclusions can be reached on the basis of this research, therefore it will be left to future research to identify the components of these procedures which contribute to treatment efficacy.

**Expectancy Variables**

Differences in the trends regarding expectancies were noted between the two treatment groups. The EMDR subjects tended to continue to increase in their expectancy ratings over time, reflecting the lessening of symptoms and maintenance of treatment gains over the course of the study. The writing subjects became more optimistic regarding treatment effectiveness between pre-test and post-test, but then became somewhat more skeptical by the time of follow-up. This trend is particularly difficult to explain, as the writing group as a whole tended to continue to improve (based on the standardized outcome measures) between the post-test and follow-up sessions.

Expectancies regarding the effectiveness of a given treatment are known to impact treatment efficacy and are often referred to as placebo effects, but not all placebos are equally effective. For example, subjects tend to report hallucinogenic experiences when told a placebo would have such an effect, and generally report more pain relief when given a "morphine placebo" than when given a "darvon placebo" (Kirsch, 1990). Contributing to the power of a placebo's effect are such factors as the expectations regarding the placebo, confidence in its effectiveness, and the credibility of the treatment (Kirsch, 1990).

Although the population of individuals diagnosed with PTSD have demonstrated an overall resistance to placebo effects (Solomon, et al., 1992), given the claims made about the effectiveness of EMDR and the novelty of the technique, one might have supposed that this treatment would have been more effective with
individuals with higher expectations for treatment. However, our data does not support such a conclusion. Individuals expressing more confidence in treatment efficacy did not have better therapeutic outcomes than those who were more skeptical. Initial expectancy scores were found to be unrelated to treatment outcome, suggesting that other factors were responsible for the treatment effects demonstrated in this research.

Hypnotizability and Its Relationship to Treatment Outcomes

Hypnosis and placebos are considered closely related and both can be used to enhance suggestions, and even reduce pain, reduce tension or improve skin conditions (Kirsch, 1990). One would expect that if expectancies played a role in treatment outcome, more hypnotizable subjects would tend to report better outcomes. Subjects with higher scores on the hypnotic susceptibility assessment would be expected to be more suggestible to verbal and nonverbal cues regarding treatment effectiveness and report better outcomes. No relationship between hypnotic susceptibility and treatment outcome was substantiated by the data, however. This suggests that other mechanisms are responsible for the treatment effects in this research.

Strengths of the Study

Although constrained by the limitations of scheduling, an attempt was made to control for demand characteristics and have trained assistants conduct both treatment and assessment sessions. This research used standardized diagnostic procedures to define characteristics of the subjects at intake and follow-up, and standardized self-report measures to gauge treatment outcomes. Standardized written protocols were used in conducting all sessions to maintain uniformity of procedures across sessions and providers.
Limitations of the Study

Unfortunately, the number of subjects participating in this research was relatively small, and the group was fairly heterogeneous, which limits the conclusions which can be drawn from the data. For example, had a larger sample size been used, true but subtle differences between the two treatment groups regarding their comparative effectiveness may have been more clear. In addition, the researcher provided some of the treatment and assessment functions and therefore demand characteristics may have influenced the outcomes. Standardized outcome measures were predominantly self-report, and more objective measures such as behavioral observations or physiological measures were not utilized. The comparison treatment (structured writing) was sufficiently different from the EMDR procedure to preclude firm conclusions regarding therapy components contributing to therapeutic efficacy.

Directions for Future Research

Research should, of course, continue to utilize experimental research designs to clarify relevant issues. This includes a continued effort to make use of larger sample sizes, control for demand characteristics, use standardized diagnostic procedures and treatment outcome measures, as well as objective assessments including physiological measures and behavioral observations of treatment outcome. Comparison treatments might be chosen in such a manner as to further clarify the components of the EMDR procedure responsible for its apparent therapeutic effectiveness. (Options might include dismantling procedures or comparisons with other established, proven methods such as systematic desensitization or Stress Inoculation Training.)

Further investigation should be conducted regarding the maintenance of treatment effects of the EMDR procedure. It may be worth exploring the pattern of
symptomology over time, or identifying the individual characteristics and treatment components associated with better maintenance of treatment effects. One distinction between our two protocols was the lack of specific procedures addressing the adaptive cognitions within the writing protocol. It is surprising that the effects of the structured writing sessions were maintained as well as they were, and that the data suggests that subjects in the writing condition tended to continue to experience reductions in symptoms between post-test and follow-up sessions.

If indeed, the writing protocol inadvertently encouraged individuals to focus more on the cognitive aspects of their experiences, this continued reduction in symptom severity would be consistent with other findings. Other research in areas of anxiety disorders (treating agoraphobics and phobics) suggests that the addition of a cognitive component to a treatment protocol may not have evident benefits immediately after treatment, but that it may enhance the maintenance of treatment gains (Barlow, 1988). Further clarification regarding the maintenance of the EMDR treatment effects is needed, and if other treatments include strategies which enhance maintenance, these components might be incorporated into the EMDR protocol to obtain better, long-term treatment benefits. Understanding not only the typical pattern of maintenance, but how to enhance the maintenance of treatment effects would constitute information vital to the full understanding and implementation of the EMDR procedure.

One of the hallmarks of PTSD is the strong tendency to avoid stimuli associated with the traumatic event. Situations reminiscent of the event are avoided, thoughts about what happened are forced out of mind, substances are abused to reduce physiological arousal and avoid associated affects, psychic numbing and constriction of affect occur. Ironically, while avoidance behaviors may seem to terminate psychic discomfort in the short-run, this process may contribute to the long-term perpetuation of symptoms. EMDR has a response prevention component, as did our writing
sessions, in that individuals who under other circumstances might tend to avoid trauma-related imagery, cognitions and associated physiological responses, are forced to experience it in smaller doses for the majority of a treatment session, while being prevented from engaging in their usual avoidant responses. The relative impact of the exposure component of the EMDR protocol remains unclear. The contributions of the many other components of the EMDR protocol remain to be elucidated, for the procedure is in fact comprised of a series of therapeutic interventions, any or all of which may contribute to treatment efficacy. A better understanding regarding the aspects of the EMDR procedure contributing to its effectiveness is needed. Some elements may be necessary, others irrelevant, but the research has not yet clarified these issues.

We may have impacted PTSD symptomology to a greater extent had we not limited the number of treatment sessions to a maximum of three. In an attempt to evaluate the effectiveness of the EMDR procedure as outlined by Shapiro (1989a, 1989b), we limited the number of treatment sessions to a number which seemed reasonable given the rapidity of treatment effects reported in the literature. In her research, Shapiro (1989a, 1989b) suggested that dramatic reductions in symptomology could be obtained in only one EMDR treatment session. Research in the future might explore the number of sessions needed to eliminate post-traumatic symptomology with a more clearly defined sample of subjects.

More clarification is needed regarding the effectiveness of the EMDR procedure with specific symptoms or diagnostic groups. The research to date suggests that the EMDR procedure has been effective in treatment post-traumatic symptoms as well as symptoms associated with other diagnostic categories, but the limits and range of generalizability of treatment effects remains to be defined. The results of this study question whether the procedure may be most effective with individuals suffering fewer...
post-traumatic symptoms. Further definition in this regard is needed. Realistic expectations regarding the number of sessions needed to significantly impact the less severe and more complex cases remain to be established.

Conclusions

While no statistical difference was detected between the two treatment groups (EMDR and structured writing), subjects treated with EMDR appeared to have slightly better treatment outcomes overall. Similarly, those with multiple traumatic experiences tended to evidence the least benefit. Process measures within sessions, namely SUDs and VoC scores, suggested patterns of improvement within sessions although subjects often reported increases in subjective discomfort before reporting reductions. Standardized self-report measures of treatment outcome suggested improvement for both groups. Typical of the EMDR subjects was a more dramatic reduction occurring between pre-test and post-test, attributable to the impact of the treatment protocols which was sometimes followed by a slight increase in symptoms reported at follow-up. Writing subjects tended to report a more gradual and continual amelioration of symptoms, often reporting noticeable reductions between post-test and follow-up assessments. The treatment gains were largely maintained at follow-up for both groups.

Expectancy scores and measures of hypnotic susceptibility were found to be unrelated to treatment outcome, suggesting that treatment effects were due to other factors. Other components of the treatment protocols themselves contribute to treatment efficacy and may need to be identified through future research.

This study suggests that both EMDR and structured writing sessions impact PTSD symptoms within a limited therapeutic context. The comparative effectiveness of the two procedures substantiates outcomes of previous research suggesting that the eye
movements may not be the essential component of the EMDR procedure. Writing about the traumatic experience in the same manner that EMDR subjects are asked to think about the experience may be equally effective. However, the components within each of these protocols responsible for treatment efficacy remain to be identified.
APPENDICES
Appendix A

Treatment Efficacy Expectancy Scale
Treatment Efficacy Expectancy Scale

Having now been given the rationale / explanation for the treatment you are to receive in this research investigation, please express your expectation regarding likely treatment outcome:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely skeptical that the treatment will have positive effects</td>
<td>Somewhat skeptical that the treatment will have positive effects</td>
<td>Withholding judgment; equally confident and skeptical</td>
<td>Somewhat confident that the treatment will have positive effects</td>
<td>Extremely confident that the treatment will have positive effects</td>
</tr>
</tbody>
</table>

Date: ____________________ (Beginning of Treatment Session 1)

Having now been given the treatment explained to you at the beginning of this research investigation, please express your current level of confidence regarding treatment outcome:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely skeptical that the treatment will have positive effects</td>
<td>Somewhat skeptical that the treatment will have positive effects</td>
<td>Withholding judgment; equally confident and skeptical</td>
<td>Somewhat confident that the treatment will have positive effects</td>
<td>Extremely confident that the treatment will have positive effects</td>
</tr>
</tbody>
</table>

Date: ____________________ (Post-test Session)

Having now been given the treatment explained to you at the beginning of this research investigation, please express your current level of confidence regarding treatment outcome:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely skeptical that the treatment will have positive effects</td>
<td>Somewhat skeptical that the treatment will have positive effects</td>
<td>Withholding judgment; equally confident and skeptical</td>
<td>Somewhat confident that the treatment will have positive effects</td>
<td>Extremely confident that the treatment will have positive effects</td>
</tr>
</tbody>
</table>

Date: ____________________ (Follow-up Session)
Appendix B

Informed Consent for Participation in an Investigation
Informed Consent for Participation in an Investigation

Western Michigan University
Department of Psychology

Principal Investigator / Advisor: C. Richard Spates, Ph.D.
Co-Principal Investigator: Lisa Largo, M.A.

I have been invited to participate in the Post Traumatic Stress Screening and Treatment Project in a study entitled "The relationship between expectancy, hypnotizability, and treatment outcome associated with eye movement desensitization in the treatment of post-traumatic stress disorder." I understand that this project is under the direction of Dr. C. Richard Tsegaye-Spates and Lisa Largo of the Psychology Department at Western Michigan University. I further understand this research is intended to study how individual characteristics are related to treatment outcome for the effects of a traumatic event. I understand that this study evaluates two different treatments for this disorder and that I will be assigned to one of them. I will not know which procedure I will receive until assigned by the researcher. I understand that in either procedure I will be required to recall certain aspects of a traumatic experience as part of therapy. I further understand that the treatment will be provided by a trained therapist and will be under the supervision of Dr. Tsegaye-Spates at all times.

My consent to participate in this project indicates that I understand that I will be asked to attend an initial assessment session, an additional assessment session, 1 - 3 treatment sessions, depending on how well the treatment works for me, and that I will be asked to return to the Psychology Clinic approximately one month after the last treatment session to complete questionnaires about my symptoms. All sessions will be conducted at the WMU Psychology Clinic by therapists trained in the use of the procedures. Some sessions may be observed by research assistants through a one-way mirror.

During the first (assessment) session I will be asked to complete one questionnaire, which asks me to respond to 90 short statements about a wide range of feelings, thoughts, and activities, and is called the Symptom-Checklist-90-Revised (SCL-90-R). After completing the pencil and paper questionnaire, I will be asked to participate in an interview lasting approximately 75 minutes, in which I will be asked to provide general information about myself such as my age, level of education and employment status. I will be asked about some of my patterns of behavior and about how the traumatic event has affected me. The second part of the interview, the Personality Diagnosis Questionnaire - Revised (PDQ-R), contains questions about my patterns of relating to other people and how I view myself. I understand that as a result of these assessments, I may not qualify for participation in the study. In that case, I may be provided with a therapist referral list, in order to seek suitable treatment elsewhere if I so choose.

During the second assessment session, I will be assessed for my ability to respond to verbal suggestions and for my creative ability and use of my imagination. This session will take approximately 1 hour. During the treatment sessions which follow, I will be asked to complete a number of questionnaires, including the SCL-90-R (described above), State-Trait Anxiety Inventory (containing questions about feelings of relaxation, anxiety and fears) and the Impact of Events Scale (which includes questions relating to my thoughts, feelings, and physical responses about the traumatic event).
As in all research, there may be unexpected risks to the participant. If an accidental injury occurs, appropriate emergency measures will be taken; however, no compensation or treatment will be made available to me except as otherwise specified in this consent form. I understand that one potential risk of my participation in this project is that I may be upset by the content of the interview or the treatment sessions. I understand, however, that Dr. Tsegaye-Spates, Lisa Largo, or another Psychology Clinic staff member is prepared to offer crisis counseling should I become significantly upset and that I would not be responsible for the cost of such crisis intervention. Should additional treatment be deemed appropriate, Psychology Clinic staff are prepared to make a referral if I need further counseling. I will be responsible for the cost of therapy if I choose to pursue it.

One way in which I may benefit from this activity is having the chance to express my feelings about the trauma, which research indicates is beneficial for individuals who have suffered from a traumatic event. I also understand that others who have experienced a traumatic event may benefit from the knowledge that is gained from this research.

I understand that all the information collected from me is confidential. That means that my name will not appear on any papers on which this information is recorded. The forms will all be coded and Lisa Largo will keep a separate master list with the names of participants and the corresponding code numbers. Once the data are collected and analyzed, the master list will be destroyed. All other forms will be retained for five years in a locked file in the Western Michigan University Psychology Clinic.

I understand that I may refuse to participate or quit at any time during the study without prejudice or penalty. If I have any questions or concerns about this study, I may contact either Lisa Largo at 387-8303 or Dr. Spates at 387-4332. I may also contact the Human Subjects Institutional Review Board at 387-8293 or the Vice President for Research at 387-8298 with any concerns that I have. My signature below indicates that I understand the purpose and requirements of the study and that I agree to participate.

__________________________________________
Signature
__________________________________________
Date
Appendix C

Human Subjects Institutional Review Board Approval
Western Michigan University
To: Lisa Largo
From: M. Michele Burnette, Chair
Re: HSIRB Project Number 93-12-01

Date: April 18, 1994

This letter will serve as confirmation that the requested changes to your research protocol, "The relationship between expectancy, hypnotizability, and treatment outcome associated with eye movement desensitization in the treatment of post-traumatic stress disorder" have been approved by the Human Subjects Institutional Review Board.

xc: Spates, Psychology
Appendix D

Graphs of Each EMDR Subject's Data

105
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject #1 (EMDR)

Impact of Events Intrusion Scores for Subject #1 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 2 (EMDR)

Impact of Events Intrusion Scores for Subject # 2 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject #3 (EMDR)

Impact of Events Intrusion Scores for Subject #3 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 5 (EMDR)

Impact of Events Intrusion Scores for Subject # 5 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 6 (EMDR)

Impact of Events Intrusion Scores for Subject # 6 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 7 (EMDR)

Impact of Events Intrusion Scores for Subject # 7 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 8 (EMDR)

Impact of Events Intrusion Scores for Subject # 8 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 10 (EMDR)

Impact of Events Intrusion Scores for Subject # 10 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 17 (EMDR)

Impact of Events Intrusion Scores for Subject # 17 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject #21 (EMDR)

Impact of Events Intrusion Scores for Subject #21 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 24 (EMDR)

Impact of Events Intrusion Scores for Subject # 24 (EMDR)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 27 (EMDR)

Impact of Events Intrusion Scores for Subject # 27 (EMDR)
Appendix E

Graphs of Each Writing Subject's Data
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 4 (Writing)

Impact of Events Intrusion Scores for Subject # 4 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 9 (Writing)

Impact of Events Intrusion Scores for Subject # 9 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject #12 (Writing)

Impact of Events Intrusion Scores for Subject #12 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 13 (Writing)

Impact of Events Intrusion Scores for Subject # 13 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 14 (Writing)

Impact of Events Intrusion Scores for Subject # 14 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 16 (Writing)

Impact of Events Intrusion Scores for Subject # 16 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 18 (Writing)

Impact of Events Intrusion Scores for Subject # 18 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 19 (Writing)

Impact of Events Intrusion Scores for Subject # 19 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 20 (Writing)

Impact of Events Intrusion Scores for Subject # 20 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 22 (Writing)

Impact of Events Intrusion Scores for Subject # 22 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 23 (Writing)

Impact of Events Intrusion Scores for Subject # 23 (Writing)
Symptom Checklist - 90 - R Anxiety Subscale Scores for Subject # 26 (Writing)

Impact of Events Intrusion Scores for Subject # 26 (Writing)
BIBLIOGRAPHY


