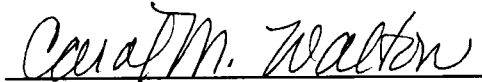


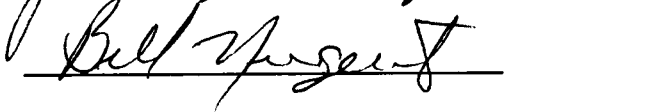
To the Graduate Council:

I am submitting herewith a dissertation written by Jonathan Whalen entitled "EMDR and Hypnosis: Theoretical and Clinical Investigation." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.


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Dean of The Graduate School

EMDR AND HYPNOSIS: A THEORETICAL AND CLINICAL
INVESTIGATION

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Jonathan E. Whalen
August 1998

DEDICATION

This dissertation is dedicated to my parents

Walter William Whalen

and

Mary Lee Whalen

ACKNOWLEDGMENTS

As with any work of this duration and complexity, there are many people without whose help this project could not have been completed. I wish to thank first and foremost Dr. Michael Nash. As my dissertation chair he guided this project with unending help and encouragement, a clear vision of how the study could be, and a sense of humour that never failed to re-energize me. As my primary advisor he has guided my clinical and research development with a rare combination of blazing intellect and personal warmth. As my mentor and friend Mike has demonstrated a generousness of spirit and heart that made my career at Tennessee very special indeed.

I wish to thank my committee for their help, patience, and guidance on this project. This project simply could not have been completed without the tremendous help of Dr. Nugent. I very much appreciate Dr. Nugent's easy availability, willingness to spend a good deal of time with me, and earnestness and warmth. Knowing he was willing to help with the design and analysis of this study was a tremendous boon to me. This is a significantly better study as a result of his input. Dr. Walton's experience with EMDR was critical for my theoretical and clinical understanding of the technique. Her excitement about the project was infectious. Dr. Lounsbury's design and statistical input was essential for a fuller understanding of the results, and a greater depth of knowledge about research design.

A very special thanks is reserved for Brenda King, M.S., R.N.. I cannot begin to express my thanks for all the technical work she put into this project. The effort she put into data collection and analysis was immense and deserves my special thanks. However, it was Brenda herself that was most helpful to me. Brenda's friendship, support, beauty of spirit, and razor sharp intellect were essential and vital blessings to me as I worked on this project. I want to thank Carla, too, for her dedicated efforts at data collection. This was a complicated study in terms of data collection, and this study could not have been completed on time without her help.

Bob Muenchen's statistical help was very helpful in determining appropriate and essential analysis procedures. At times, he seemed more excited about this project than I was!

I cannot thank Myra Kawaguchi enough for her friendship and soothing ways. Always helpful, supportive, and encouraging, I knew I could turn to Myra when needing a boost. She has been a special friend these past four years.

Abstract

Eye Movement Desensitization and Reprocessing (EMDR) is a controversial new treatment for anxiety disorders that is purported to evince rapid and lasting treatment gains. EMDR theorists argue that humans have an innate biological drive to process events and their memories into adaptive and useful forms. Traumatic memories become "stuck" and unprocessed, resulting in a host of psychopathological symptoms. EMDR's curative power rests primarily in the eye movements. Shapiro argues that the eye movements directly access and alter traumatic memories at a neurophysiological level. Memories are then processed down into adaptive forms, with a concomitant abatement of symptoms. Research supports the clinical efficacy of EMDR. However, there is much debate as to the actual mutative element in the EMDR protocol. Support for eye movements playing a curative role is meager and equivocal. This study examines the proposition that the primary mutative component of EMDR is response to suggestion. Specifically, this study proposes that the EMDR treatment protocol is laced with suggestion for improvement. Highly hypnotizable individuals will respond to these suggestions even though EMDR is an explicitly non-hypnotic treatment. That is, subjects will improve to the extent they respond to suggestion. Further, this study tests the viability of Shapiro's eye movement theory. An eye movement condition is compared to an eye fixation condition in terms of treatment outcome. Results indicate a positive correlation between subjects' hypnotizability and treatment outcome. In addition, eye movement conditions were as efficacious as eye fixation conditions where treatment outcome is concerned.

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1. EMDR LITERATURE REVIEW

EMDR (Eye Movement Desensitization and Reprocessing) is a "structured, prescriptive, and time limited treatment technique designed to alter the affective and semantic content of memory images developed as a consequence of emotional or physical trauma" (Lohr, Kleinknecht, Tolin, Barrett, 1995) Francine Shapiro reports discovering EMDR (1989a, 1989b) when walking through the woods one day and noticing that disturbing thoughts were suddenly disappearing from her mind and not returning. Puzzled, she re-examined her experience and "noticed that when disturbing thoughts came into my mind, my eyes spontaneously started moving very rapidly back and forth " (Shapiro, 1995, p. 2). Shapiro then purposefully recalled the thoughts and memories only to discover that they were not nearly as upsetting as before. The previously upsetting thoughts and memories had lost much of their affective "punch". Shapiro formalized her observations into a treatment technique she originally titled Eye Movement Desensitization (EMD). Briefly, the procedure is as follows. The client is asked to concentrate on a specific memory\image that represents the traumatic experience that troubles the client. A discussion of the specific image is unnecessary, the client need only hold the image in his\her mind. Next, the client is asked "what words about yourself or the incident best go

with the pictures" (Shapiro, 1989b, p. 213) (ie: "I did poorly", "I am not in control"). The client is then instructed to fully concentrate on the image and the belief statements and assign a Subjective Unit of Distress (SUDs) rating (Wolpe, 1990; 0 = neutral, 10 = highest level of anxiety). The client is also to identify specific physical locations where he/she is somatically experiencing anxiety. The client is then instructed to state how he/she would rather feel, and to supply a new positive cognition statement reflecting that desire (ie: "I did ok", "I am in control"). The client then rates how true the new cognition feels to him/her on the seven point Likert Validity of Cognition Scale (VOC; Shapiro, 1989a, 1989b; 1 = completely untrue, 7 = completely true). The VOC was created by Shapiro specifically for the EMD procedure. Its psychometric properties have never been examined. The client is then directed to visualize the chosen traumatic scene, rehearse the chosen negative cognitions, focus on the physical sensations of the anxiety, and lastly, to visually track the therapist's finger as it rapidly (left to right to left twice in one second, distance covered appx. 12 inches) moves back and forth 12 to 14 inches in front of the client's face at eye level. Twelve to 24 complete circuits are grouped into a set. After a set is completed, the client is told to blank the memory from their mind and breath deeply. The client then calls up the memory image, negative cognitions, and physical sensations, and reports a new SUDs rating. In general, Shapiro has found that approximately three to 15 sets of saccades are needed to lower SUDs

rating to zero or one for a particular image. This varies according to client and presenting complaint, of course. When SUDs rating has dropped to zero or one, the client is asked to give a VOC rating of the self generated positive cognition. Regardless of that rating, the client is instructed to call up the original memory, the desired cognition, and to track another set of saccades. A new VOC is asked for, and this process repeated until the VOC rating plateaus. Shapiro has incorporated many sub-protocols designed to treat new memories or cognitions that arise, memories that retain their original SUDs rating, VOC ratings that do not improve, etc..

Her original hypothesis concerning the mutative factor in the EMDR protocol focused primarily upon the eye movements themselves. Shapiro argued that humans have an inherent biologically driven system that processes information to an adaptive resolution (Shapiro, 1994). She references Pavlov's (1927) theory that when a person experiences a traumatic event, the brain's normal inhibition\excitatory patterns are changed, and the trauma memory is pathologically maintained in its anxiety producing form. The experience is not processed in an adaptive, functional manner, rather it is "stuck" in its maladaptive form, triggering flashbacks, nightmares, etc. The coupling of the saccadic eye movements to the recalling of images and cognitions, may produce a return of neuronal balance, thus allowing "stuck" material to be processed to resolution and adaptation. For support, Shapiro notes that PTSD combat veterans have been found to enter rapid

eye movement (REM) sleep later than non-PTSD individuals, and stay at REM sleep for significantly less time than non-PTSD individuals. Thus, she postulates, saccadic eye movements may "represent the brain's automatic inhibitory (or excitation - releasing) mechanism" (Shapiro, 1989b, p. 216). Shapiro conjectures that the EMDR protocol (specifically eye movements) may involve "1) disruption of the complex of habitual physiological responses elicited by the traumatic memory, 2) distraction, 3) induction of a profound trance state (analogous to hypnagogic sleep states) in which the client accepts self-induced suggestions, 4) interferences with the trace memory caused by neuronal bursts which typify eye movement, 5) neurophysiological aspects of eye movement effects such as REM induced muscular inhibition by way of the reticular formation, parasympathetic involvement, or effect on cortical neural functions" (Shapiro, 1991, p. 134).

In 1991 Shapiro published an article in which she changed the name of her technique in order to reflect a greater emphasis on the information processing mechanism she felt is inherent in the procedure. The new name is Eye Movement Desensitization and Reprocessing (EMDR). Shapiro argues that EMDR can be viewed from a behavioral/cognitive standpoint as being an "accelerated information processing" (AIP) technique. This change did not reflect a de-emphasis of the biologically based explanations (ie., Pavlov, 1927) of EMDR's curative factor, but an elevation of the information

processing component that had always been present. Referring to the AIP aspects of EMDR, Shapiro states that EMDR's "continued manipulation of client attention regarding the discrete elements of the traumatic configuration (picture, self-assessment, and physical sensations) which EMDR entails, may be efficacious in its own right" (Shapiro, 1991, p. 134).

In sum, Shapiro states that EMDR is an effective clinical tool because it allows direct physiological engagement with psychopathology, that can be represented as physiologically stored, unprocessed, dysfunctional information. While treatments such as biofeedback, flooding, and relaxation training address reactions to trauma, EMDR targets memories themselves. When information encoded in the "stuck" memories is transformed physiologically, Shapiro argues that concomitant shifts in affect, behavior, and cognitive structures naturally follow. The greatest benefit of EMDR she states, may be its "ability to facilitate profound therapeutic change in much less time than traditionally assumed" (Shapiro, 1994, p. 154) as a result of its direct, physiological manipulation of memory itself.

Empirical Evidence.

Since its inception in 1989 (Shapiro, 1989a, 1989b) EMDR has excited clinicians across the country with its promise of fast, significant, and lasting relief from negative and troubling affects associated with traumatic memories. Over the past seven years EMDR has stimulated lively and energetic research activity that has produced a sizable literature.

In general, the body of EMDR related work published before 1992 is characterized by a large number of case studies and a few experimental group comparison or single subject design studies. These studies have, for the most part, found EMDR to be a very effective clinical tool, and have fueled intense interest in EMDR. However, this body of work is also characterized by a number of methodological concerns that cast doubt upon the clinical efficacy of EMDR (see Table 1).

Chief among these concerns are the use of non-standardized assessment batteries, questions concerning diagnostic classifications of subjects, inappropriate or nonexistent standardized devices to measure change, and various types of procedural confounds (ie: data collection and treatments done by the same person). Studies from roughly 1993 forward, are characterized by larger numbers of controlled experimental investigations of either group design or single subject design. Overall, these studies attempt to redress methodological limitations present in earlier research designs by using control groups\comparison treatment groups, employing a wide variety of standardized and\or objective assessment devices, more thoroughly assessing the level and intensity of pre treatment morbidity, monitoring the process of change more closely, and assessing post treatment change, if any, more thoroughly (see Table 2).

Table 1

Description of published studies of EMDR (1989-1992).

Subjects		Assessment			Treatment		Outcome		
Author(s)	N	Gender	Diagnosis	Self report	Physio	Behavioral	Comments	Immediate post treatment	Follow up
Shapiro (1989a)	1	F	Rape trauma	SUD VOC	No	No	EMDR (single session)	SUD decrease to 0 VOC to 7	3 months gains maintained
Shapiro (1989b)	22	5 M 17F	17 PTSD Traumatic memories	SUD VOC Complaints	Pulse rate	No	Placebo group design (N sessions?)	SUD, BOC, PR & Complaints decreased significantly, placebo no change improved when treated	1 & 3 months gains maintained
Wolpe and Abrams (1991)	1	F	Rape trauma	SUD Willoughby Verbal report	No	No	15 dynamic Sessions caused exacerbation Relaxation + EMD for 15 sessions	Symptom free	5 months symptom free
Puk (1991)	1	F	Childhood sexual abuse	SUD	No	No	Single session	SUD: 100 to 0	12 months only one nightmare
	1	F	Trauma due to dying sister ¹ Dep.	SUD	No	No	Single session	Sud: 100 to 0	5 months no intrusive thoughts

Table 1 (continued).

Subjects		Assessment			Treatment		Outcome		
Author(s)	N	Gender	Diagnosis	Self report	Physio	Behavioral	Comments	Immediate post treatment	Follow up
Marquis (1991)	78	--	15 different Non-psychotic Axis I & II diagnoses	Self report	No	No	EMDR	Anxiety adjustment disorders most successful/Axis II, least	1 week to > 1 year
Kleinknecht and Morgan (1992)	1	M	PTSD asault (8 yr. History)	CESD BSI STAI Symptom report narrative	No	Approach trauma sites	8 EMDR sessions	Clinically relevant decrements on all measures, return to site without anxiety	4 & 8 month assessment gain maintained
Lipke and Botkin (1992)	5	M	Chronic PTSD Veterans substance abuse	M-PTSD SUD	No	No	Extensive prior treatment	4 of 5 showed "marked decreases in stress"	None reported

Source: Lohr, J. M., Kleinknecht, R. A., Conley, A. T., Dal Cerro, S. Schmidt, J., & Sonntag, M. (1992). A methodological critique of the current status of eye movement desensitization (EMD). *Journal of Behavior Therapy and Experimental Psychiatry*, 23, 159-167.

Table 2

Published Studies on the Effectiveness of EMDR (1992-1995).

Authors	N of Subjects	Type of Data	Sample Occasion	Disorder/Dx	Effectiveness
Vaughan et. al. (1994a)	10	Nonstd. Std.	Pre-tx During tx Post-tx FU	PTSD DSM-III-R	8\10 "considerable improvement".
Vaughan et. al. (1994b)	36	Nonstd. Std.	Pre-tx Post-tx FU	PTSD DSM-III-R	All tx groups improved.
Hekmat et. al. (1994)	30	Nonstd. Std.	Pre-tx. During tx. Post-tx	Controlling acute pain	Both tx's relieved pain over a control group.
Foley & Spates (1995)	40	Nonstd. Std. Behavioral Physio.	Pre-tx During tx Post-tx	Public speaking anxiety	EMD comparably effective as other tx's, but all tx's limited.
Montgomery & Ayllon (1994a)	6	Nonstd. Std. Physio.	Pre-tx During tx Post-tx FU	PTSD DSM-III-R	EMD significantly effective vs. non-eye mvmt. EMD. Physio not significantly change for either group.

Table 2 (continued).

Authors	N of Subjects	Type of Data	Sample Occasion	Disorder\ Dx	Effectiveness
Montgomery & Ayllon (1994b)	1	Nonstd. Std. Physio.	Pre-tx During tx Post-tx	PTSD DSM-III-R	Significant gains with EMD, but not profound effects.
Bauman & Melnyk (1994)	30	Nonstd. Std.	Pre-tx During tx Post-tx	Test anxiety	SUDs significantly decreased for EMDR and finger tapping group.
Gosselin & Matthews (1995)	41	Nonstd. Std.	Pre-tx During tx Post-tx	Test anxiety	Std. measures decreased for EMDR and no eye-mvmt groups. SUDs decreased for EMDR.
Goldstein & Feske (1994)	7	Nonstd. Std.	Pre-tx. During tx Post-tx	Panic DO, Agoraphobia, GAD\Simple phobia DSM-III-R	EMDR significantly relieved panic attacks, fears about painc attacks, general anxiety, depression, etc.
Kleinknecht (1993)	1	Nonstd. Std. Physio. Behavioral	Pre-tx During tx Post-tx FU	Simple phobia DSM-III-R	EMD successful tx.
Spates & Burnette (1995)	3	Nonstd.	During tx FU	PTSD	EMD "produced rapid resolution...recovery"

Table 2 (continued).

Authors	N of Subjects	Type of Data	Sample Occasion	Disorder/Dx	Effectiveness
Pellicer (1993)	1	Nonstd.	During tx FU	Dream anxiety disorder DSM-III-R	Single session complete remission.
McCann (1992)	1	?	?	PTSD DSM-III-R	Asymptomatic at one year.
Wilson, Becker & Tinker (1995)	80	Nonstd. Std.	Pre-tx During tx Post-tx FU	2 PTSD criteria for 95%, 46 full PTSD. DSM-III-R	Immediate and delay tx groups improved.
Silver, Brooks & Obenchain (1995)	100	Problem Report Form	Pre-tx Post-tx	PTSD	EMDR more effective than Biofeedback or Relaxation tx.
Wernik (1993)	2	Nonstd.	During tx	Sexual dysfunction	EMDR tx successful.
Renfrey & Spates (1994)	23	Nonstd. Std. Physio.	Pre-tx During tx Post-tx	PTSD DSM-III-R ?	EMD as effective as moving light EMD, and non eye mvmt. EMD.
Jensen (1994)	25	Nonstd. Std.	Pre-tx During tx Post-tx	PTSD DSM-III-R	"EMDR showed little effectiveness"

Table 2 (continued).

Authors	N of Subjects	Type of Data	Sample Occasion	Disorder/Dx	Effectiveness
Aceirno et al. (1994)	1	Nonstd. Std. Behavioral Physio.	During tx Post-tx	Simple phobias DSM-III-R	EMDR as effective as control procedures, and not as effective as in-vivo exposure tx.
Oswalt, Anderson & Hagstrom (1993)	8	Nonstd.	During tx	PTSD	EMDR successful in 3/8 cases.
Sanderson & Carpenter (1992)	58	Nonstd.	During tx FU	Phobias	EMDR as effective as Image. Confrontation tx.
Young (1994)	2	Nonstd.	During tx	Phobia in an MPD population	"Significantly beneficial results with a single session".
Forbes, Creamer & Rycroft (1994)	8	Nonstd. Std. Physio.	Pre-tx During tx Post-tx FU	PTSD DSM-III-R	Significant improvement on all measures.

Notes: Type of data:

Std = Standardized instruments.

Nonstd = Nonstandardized instruments.

Physio = physiological assessment.

Behavioral = indicator of changed targeted behavior

Occasions: Pre-tx = pretreatment or baseline

During = ongoing assessment during tx.

Post-tx = posttreatment

FU = follow up

Disorder/Dx: If meet
DSM criteria, will
have below Dx
"DSMIII-R"

The need for empirically rigorous research on the treatment efficacy of EMDR is all the more important considering the rapidly growing interest and use of technique. For example, the first six months of 1996 will see no less than 26 Level I training seminars being held throughout the United States. In previous years up to eight international training seminars have been held. While originally designed to treat individuals suffering from Post Traumatic Stress Disorder (PTSD), EMDR use has expanded to treat a wide variety of psychopathologies ranging from PTSD, phobias, sexual dysfunctions, pain control, panic attacks, and substance abuse. Again, while originally designed as a treatment for adults, at least one study has examined the successful single session use of EMDR with a 10 year old girl suffering recurrent nightmares (Pellicer, 1993). This explosion of interest is also reflected in the number of EMDR related publications since 1989. Shapiro (1994, p. 155) notes that "EMDR has had more published case reports to support it than either systematic desensitization or flooding in the treatment of PTSD during a comparable time period".

Yet, some researcher are troubled by the rapid growth and quick acceptance of EMDR as a treatment technique given the limited body of sound research speaking to its effectiveness. Acierno, Hersen, Hassett, Tremont, and Meuser (1994) note objections to the marketing of EMDR as a prescribed treatment for PTSD, stating that "prescriptive interventions are those standardized treatments that have been repeatedly found to be

effective under precisely known conditions, with precisely known population, suffering from precisely defined disorder" (p. 297). They argue that the level and quality of EMDR research to date is not sufficient enough for EMDR to fulfill those conditions. Mueser, (1992); Lohr, Kleinknecht, Conley, Dal-Cerro, Schmidt, and Sonntag, (1992); and Lohr, Kleinknecht, Tolin, and Barrett, (1995) caution against uninformed acceptance of this new treatment technique until further research sheds more light on 1) the clinical effects of the procedure, 2) the components of the protocol that bring about clinical change, and 3) analysis of EMDR's effectiveness comparable to other treatments in terms of therapeutic change.

What follows is a critical examination of the body of EMDR related research with an emphasis on examining treatment efficacy, protocol components responsible for change, and differential effectiveness vis-a-vis standard psychotherapeutic treatments.

Treatment Efficacy.

Shapiro (1989a) randomly assigned 22 subjects with a history of trauma to an EMDR treatment group, or a control group that retrieved their traumatic memories without engaging in saccadic eye movements. Data collection and treatment administration were both performed by the author. Dependent measures were SUDs ratings, VOC ratings, and pulse rate. Pulse rate was recorded manually before and after the desensitization procedure. Results after one session indicated significant improvement on

SUDs ratings, VOC ratings, and pulse rate for the eye movement group over the non eye movement group. On the basis of these results, Shapiro concluded that EMDR with eye movements was an effective treatment for anxiety related to traumatic experiences.

In this study, however, no steps were taken to ensure subjects met DSM-III-R criteria for PTSD (indeed, five of the 22 subjects were counselors who "desired relief" from traumatic memories themselves). Further, no standardized measures of symptom change and/or stability were applied before, during, or after EMDR treatments. Lastly, pulse rates were monitored only for the eye movement group and not the non eye movement group. This extra procedure may have differentially influenced the expectations of EMDR group members vs. non eye movement EMDR group members.

In a case study, Shapiro (1989b) treated a 63 year old rape victim suffering trauma related symptoms (anxiety when alone, intrusive thoughts, nightmares). She treated three memories associated with the trauma in a single 50 minute session. Dependent measures consisted of SUDs and VOC ratings. For the subject's first image relating to the rape, a starting SUDS level of 10 was reduced to zero after four sets of saccadic eye movements. The other two images related to the trauma were likewise treated, and SUDs levels dropped to three and zero respectively. The subject's VOC rating at the end of the session was the highest possible: seven. A three month follow-up revealed the subject's presenting complaints had not returned since

the conclusion of the treatment session. In line with conclusions derived from her previous study, Shapiro concluded that EMDR was therapeutically efficacious in the treatment of rape trauma.

Several methodological flaws hinder the ability to draw this causal inference from the data, however. First, Shapiro did not assess pre treatment symptom stability via multiple baseline measurements. Therefore, the impact on treatment outcome by non-specific treatment effects cannot be fully assessed (ie: spontaneous remission, pronounced symptom variability, etc.) Further, no standardized instruments were employed to assess symptom change or overall functioning, and no validated evaluation measures were employed to assure the presence of diagnostically significant symptoms before treatment began. As a result, the data should be viewed with caution for, in addition to the stated methodological concerns, case reports by their very nature "preclude causal inferences of treatment even for these specific individuals. In addition, they provide no information regarding the generality of treatment effectiveness" (Lohr et. al, 1992, p. 162).

Wolpe and Abrams (1991) treated a 43 year old woman suffering rape related PTSD symptoms of nine years duration. Treated with EMDR for 11 session, the woman reported complete symptom relief that was maintained at a five month follow up. While these results support the clinical efficacy of EMDR, it should be noted that this woman had also received 15 session of psychodynamically oriented psychotherapy before her EMDR treatments.

While she reported little symptom relief, and even some symptom exacerbation from the dynamically oriented treatments, the possibility of a treatment confound exists. As with the Shapiro studies, Wolpe and Abrams did not employ standardized assessment instruments to assure presence of diagnostically significant psychopathology. Nor was symptom stability assessed through a multiple baseline design. As such, causal relationships between EMDR treatments and symptom relief are inconclusive.

Puk (1991) reports two case studies involving a 23 year old sexually abused woman, and a 33 year old woman experiencing intrusive thoughts related to her sister's death. Both women were successfully treated with one session of EMDR. Treatment gains were present at a one year follow up for the 23 year old, and at six month follow up for the 33 year old. Dependent measures included the usual SUDS and VOC ratings. Once again, the results suggest EMDR is effective in relieving symptom complaints linked to emotional trauma. Yet these results are clouded by the lack of objective and/or standardized dependent measures of symptom severity, stability, change, and relief.

Marquis (case series, 1991) treated 78 individuals with complaints of anxiety secondary to a wide range of psychopathology from PTSD, agoraphobia, personality disorders, and schizophrenia. In addition to EMDR treatments, a variety of other treatments such as skill training, relaxation training, and cognitive restructuring were employed at the same time.

Results indicate significant improvement as measured by a four point scale (0 = unchanged, 3 = cured or nearly cured). At one week to one year posttreatment follow up, Marquis found a significant mean improvement rating of 1.85 on the scale. In spite of an impressive string of 78 EMDR treatment successes, one has to accept these results with reserve as there were no standardized\objective assessments of pathology employed.

Multiple PTSD treatments also leave open the possibility of treatment confound. Causal relationships between symptom relief and treatment would have been aided if a comparison treatment, or a non-treatment control group were included in the design. As in the previously cited case studies, both data collection and treatment were conducted by the same person, leaving open the question of unintentional experimenter bias. Lastly, no information as to how diagnoses were established, or how the EMDR treatments were implemented was provided. Together, these findings are compromised by internal validity flaws that may lead to an increase in Type I errors.

Pellicer (1993) treated a 10 year old girl suffering recurrent nightmares (snakes crawling over her body) and concomitant behavior problems (negativism, stubbornness, lability, etc.). Baseline measurement revealed the girl experienced nightmares five out of seven nights. A simplified (due to intellectual limits of a 10 year old) EMDR treatment resulted in no nightmares the night after the first session. Six week after conclusion of treatment, the patient still experienced no nightmares, but did report two non-anxiety

provoking dreams in which snakes were present. A six month follow up revealed treatment gains were fully maintained. This is a unique study in the EMDR field as it applies an ostensibly adult oriented treatment to a child. Notwithstanding, EMDR was effective in relieving this young girls upsetting nightmares.

Kleinknecht (1993) treated a 21 year old female with a blood and injection phobia of 16 years duration. Dependent measures taken at pre, post, and four week follow up included the Mutilation Questionnaire (Klorman, Hastings, Weerts, Melamed & Lang, 1977), The Dental Fear Survey (Milgram, Wienstein, Kleinknecht, & Getz, 1985), The Medical Fears Survey (Kleinknecht, 1991), The Medical Avoidance Survey (Kleinknecht, 1991), The Injection Phobia Scale (Ost & Hugdahn, 1992) and SUDs ratings. Also measured were the subjects blood pressure and pulse rate. Lastly, a behavioral outcome measure was used to determine if the subject could seek out and receive an injection (flu shot). The subject met DSM-III-R criteria for simple phobia as measured by the MQ and IPS. Results indicated significant improvement on the behavior (she got a shot), self report, and physiological measures. Gains were maintained at the four week follow up. This study found EMDR to be an effective, time limited treatment for injection phobia.

In one to the first controlled group designs incorporating physiological and standardized measures, Boudewyns, Stwertka, Hyer, Albrecht, and Sperr (1993) treated 20 male Vietnam Veterans with diagnosable PTSD as

measured by Clinician Administered PTSD Scale (Blake, Weathers, Nagy, Kaloupek, Klauminzer, Charney, & Keane, 1990). Other standardized measures of symptomatology included the Mississippi PTSD Scale (Keane, Caddell, & Taylor, 1986) and the Impact of Experience Scale (Horowitz, Wilner, & Alvarez, 1979). Further measures included SUDs ratings, and therapist ratings of subject responsiveness to treatment. Physiological measures were recorded and included electromyographic response (EMG), electrodermal response (EDR), and skin temperature. All subjects at the time were receiving standard Veterans Administration milieu treatment. Subjects were randomly assigned to an EMDR group, an Exposure Control group (similar treatment as the EMDR group, but without eye movement), or a milieu treatment only group. Pre and post (one week after treatment) rating were sampled on the SUDs, CAPS, IES, and Mississippi PTSD scale. Physiological ratings were sampled while the subject listened to an audiotape recording of their trauma memory and individual cognitive responses to that memory, that had been taped during a pre treatment baseline session. Results indicated no differences between groups on any physiological measure. SUDs ratings post treatment were lowest for the EMDR group. Therapist rating of treatment response also favored the EMDR group. However, when SUDs ratings were recorded outside the context of the EMDR procedure (while subjects listened to the audio tape) they did not differ between groups. This finding may indicate that SUDs rating are susceptible

to inherent procedure demand characteristics. No between group differences were found on the CAPS, IES, Mississippi PTSD scales. In fact, within groups, none of these measure changed appreciably from their pre treatment baselines. The effectiveness of EMDR to impact change as measured by these instruments was not demonstrated. EMDR's impact could only be detected by changes in SUDs ratings in the within context condition (SUDs for the EMDR group during treatment). The authors speculate this may be a nonspecific treatment effect due to the novelty of intervention. The therapist ratings may also be effected by this factor, especially since therapists were aware of group membership.

Forbes, Creamer, and Rycroft (1994) recruited eight subjects suffering from PTSD as measured by the SI-PTSD (Structured Interview for PTSD, Davidson, Smith & Kukler, 1989), and the SCID (Structured Clinical Interview for DSM-III-R, Spitzer, Williams, Biggon & First, 1988). Pre treatment assessment measures included the SCL-90-R (Symptom Checklist-90-revised, Derogatis, 1977), the GSI (Global Severity Index; a measure of overall number and severity of problems) from the SCL-900-R, the IES (Impact of Experience Scale; Horowitz, Wilner, & Alvarez, 1979), and the BDI (Beck Depression Inventory; Beck, Rush, Shaw, & Emery, 1979). Subjects were also assessed pretreatment for suggestibility levels on the SHCS (Stanford Hypnotic Clinical Scale; Morgan & Hilgard). EMG (muscle tension) readings were recorded at each treatment session and at pre and post

treatment interviews. Subjects were treated in four 90 minute EMDR sessions. A follow up one week later included the SI-PTSD and the three self report measures. A three month follow up consisted of the SI-PTSD, SCID, and self report measures.

Results indicate significant improvement on the SI-PTSD measure all the way through the three month follow up. The authors then investigated the proportion of subjects demonstrating significant improvement as defined as post treatment scores less than two standard deviations below the mean of the pre treatment sample. (Jacobson, and Traux, 1991; Foa, Rothbaum, Riggs, and Murdock, 1971). 75% of subjects showed improvement, 62% at the three month follow up. However, in spite of these improvements in symptoms, four subjects still met PTSD diagnostic criteria. All self report measures indicated significant improvement pre to post treatment. No changes were detected between post treatment and follow up on the self report measures. Interestingly, EMG effect size analysis indicated large reductions in muscle tension first to last treatment session. This is surprising as very few studies including physiological dependent measures have detected changes. Suggestion scores were significantly correlated with pre to post treatment improvement (used as the dependent variable). This relationship, the authors concluded, were accounted for by reductions in the "avoidance" symptom cluster. This correlation was non significant however when pre treatment to three month follow up scores were used as the

dependent variable. In this study, EMDR was able to significantly reduce anxiety symptoms related to PTSD.

Jensen (1994) investigated the effectiveness of EMDR in the treatment of 25 Vietnam War Veterans with PTSD (as measured by the Structured Interview for PTSD; Davidson, Smith, & Kudler, 1989) who were assigned to a EMDR treatment group, or a non treatment control group. The SI-PTSD, SUDs and VOC ratings were taken pre and post treatment. In addition, the Goal Attainment Scaling (Diresuk & Sherman, 1968) and the Mississippi Scale for Combat-related PTSD (Keane, Caddell, & Taylor, 1986) were administered post treatment. Results indicated that EMDR was effective in reducing in-session anxiety (SUDs). However, EMDR treatments did not significantly alter PTSD symptomatology (SI-PTSD, M-PTSD) compared to the no treatment control group. In contrast to the Forbes et.al. (1994), this study was unable to detect any significant treatment effects for the EMDR procedure.

Vaughan, Wiese, Gold, and Tarrier (1994a) treated 10 consecutive individuals suffering from PTSD. All subjects were initially screened with the PTSD Structured Interview (SI-PTSD, Davison & Foa, 1989) to ensure a DSM-III-R diagnosis of PTSD could be applied. Subjects were further pre-screened for depression comorbidity on the Hamilton Rating Scale for Depression (Hamilton, 1960). Screenings were conducted by one author (RG) who administered no treatments. The next author (KV) treated all 10

subjects for one to six sessions, lasting 45 to 60 minutes each. Dependent measures were the SI-PTSD and Hamilton Rating Scale for Depression administered at pretreatment, posttreatment, and at an eight to 12 week follow up session. Results indicated significant relief in PTSD symptoms (specifically re-experiencing flashbacks, and dreaming, but not for re-living and psychological stress to events symbolic of trauma), and for depression scores. At follow up, all gains were maintained except for hyper arousal and depression scores. In their review of this particular study, Lohr et. al. (1995) comment that "when appropriate statistical analyses were applied, the clinical effects were much less reliable and the standardized measures of PTSD symptoms revealed little in the way of reliable change" (p. 294). However Lohr et.al. (1995) do not indicate what "appropriate statistical analyses" were, or who applied them. Thus, the moderate effectiveness of EMDR in treating PTSD symptomology in this study is in doubt.

A study by Montgomery and Ayllon (1994b) explored the efficacy of EMDR in treating one subject with multiple images stemming from two distinct traumas. This individual was diagnosed with PTSD and Generalized Anxiety Disorder as measured by the PTSD portion of the Anxiety Disorders Interview Schedule-Revised (DiNardo et.al., 1985). Dependent measures taken pre, post, and at one and two month follow up consisted of the SCID (Spitzer et. al., 1990), SCID-II (Spitzer, Williams, & Gibbon, 1987) and the Lazarus Multi-Modal Life History Questionnaire (Lazarus, 1981). Results indicated

significant changes during treatment that were maintained after two months. This study found EMDR to be effective therapeutically but that treatment for one image did not appear to generalize to the second image.

Goldstein and Feske (1994) treated seven subjects all whom met DSM-III-R criteria for panic disorder as measured at pre treatment by the Structured Clinical Interview for DSM-III-R (Spitzer et. al., 1990). Five had concomitant diagnoses of simple phobia, and five for generalized anxiety. One week before and after treatment, all subjects were administered the Agoraphobic Cognitions Questionnaire (Chambers, Caputo, Bright, & Gallagher, 1984), Mobility Inventory for Agoraphobia (Chambers, Caputo, Jasin, Gracely, And Williams, 1985), the Beck Anxiety Inventory (Beck and Steer, 1990), the Beck Depression Inventory (Beck and Steer, 1987), the brief Symptom Inventory (Derogatis, 1975a), and the abbreviated Symptom Checklist 90-R (Derogatis, 1975b), and the Distress Scale (DS). All treatments were conducted by the second author, and lasted for five 90 minute sessions. Results indicated significant clinical improvement pre to post across all measures. However, a closer examination of the individual items on the assessment batteries indicate "Clinical Improvement" was observed on only 17 of 35 specific items on the assessment batteries, and "Recovery" on only 13 of the 35 indices. While EMDR was found to be a statistically significant intervention in this study, the clinical significance is less clear. The authors note that variance in the frequency of symptoms

within subjects (three subjects had very low frequency of panic attacks at pretest) and the simple passage of time may have impacted these results. Although the authors further believe the likelihood of spontaneous remission is low.

Wilson, Becker, and Tinker (1995) incorporated the use of multiple therapists, standardized measures, evaluators blind to the experimental condition, and treatment fidelity checks, in their study of 80 subjects with PTSD. Subjects met DSM-III-R criteria for PTSD as measured by the PTSD Interview (Watson, Tuba, Manifold, Kuala, and Anderson, 1991). Subjects were randomly assigned to either an EMDR treatment group, or a 30 day waiting period that was then followed by EMDR treatments. Dependent measures included the Impact of Experiences Scale (Horowitz et. al., 1979), State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Bagg, & Jacobs, 1983), and the Symptom Check List-90-Revised (Derogatis, 1992). Subjects were assessed on these measures when recruited, one month after treatment, and during a three month follow up. During treatment SUDs ratings dropped for both groups, while VOC rating increased for both groups. When assessed one month after treatment, members in the immediate treatment group displayed improvement across all standardized measures. While such a trend was evident in the delayed treatment group, it was not as strong, and was evident on SUDs and IES ratings only. Both groups maintained gains three months later. The authors concluded that EMDR was

effective in reducing trauma related anxiety.

Protocol Component Responsible for Change.

In an interesting study, Hekmant, Groth, and Rogers (1994) examined EMDR's ability to manage acute pain during a cold water hand emersion (cold pressor test). Thirty college students were recruited for this study and randomly assigned to one of three groups: EMDR's treatment, EMDR plus music, and a non treatment control group. The authors note that music is effective in countering anxiety states, promoting self-control, and creating pleasant mood states (Bailey, 1983, 1986; Eifert, Craill, Carey & O'Conner, 1988; Goldstein, 1980). Therefore, they examined the hypotheses that 1) EMDR would be effective in pain control, and 2) that music could replace the cognitive reprocessing component of the EMDR protocol, and be just as effective a pain control technique as EMDR with the cognitive reprocessing component included. In the first session, subjects were medically screened then administered the Harvard Hypnotic Susceptibility Scale to assess suggestibility. During the second session, mood was assessed on the Multiple Affect Adjective Checklist, Today Form (Zuckerman, and Lubin, 1965). Subjects anger, anxiety, and sadness were further assessed using an 11 point Likert scale the authors have employed in previous studies (Hekmat, and Hertel, 1993; Hertel and Hekmat, 1994; Holmes, Hekmat, and Mozingo, 1983.) These dependent measures were assessed after each hand immersion. Experience of pain was also measured on a 11 point Likert scale.

Pain threshold was defined as hand immersion to first discomfort, pain tolerance as total time of hand immersion, and pain endurance as threshold to hand withdrawal. The second session consisted of assessment via the dependent measures and three hand immersion. EMDR was applied after the second hand immersion. EMD\M (EMDR with music replacing the reprocessing portion of EMDR) was applied after the third hand immersion.

Overall, results indicated that both treatments allowed subjects to control their pain to a significantly better degree than the control group. EMDR plus music did not differ significantly from EMDR without music in attenuating pain. Further, individual differences on hypnotic susceptibility did not interact with treatment outcome to any significant degree. The authors note that mood states changed from tension and anxiety to general relaxation and low anxiety. The results of this study indicate that EMDR with music replacing the reprocessing component is as effective a pain control technique as EMDR with the reprocessing component. The reprocessing component of the protocol was not essential in control pain under these conditions.

Montgomery and Ayllon (1994a) investigated the importance of eye movements in treatment outcome. Six subjects meeting DSM-III-R criteria for PTSD were pre and post screened on the SCID (Spitzer et. al., 1990), SCID-II (Spitzer et. al., 1987), Beck Depression Inventory (Beck et.al., 1961), Anxiety Disorder Interview Schedule-Revised (DiNardo et.al., 1985), a revised Betts Questionnaire on Mental Imagery (Sheenan, 1967), The Fear

Survey Schedule (Wolpe & Lang, 1969), SUDs ratings, and physiological measures (blood pressure and pulse). Subjects were initially treated for three sessions with a standard EMDR protocol but without eye movements. Immediately after, the standard eye movement included EMDR protocol was administered to the subjects. Results indicated no significant changes in pulse or blood pressures across phases of treatment. Further, comparison of the standard EMDR protocol without eye movements to the EMDR protocol with eye movements added in, detected no significant differences on intrusive thoughts or dreams. SUDs ratings, however, were significantly lower after the inclusion of eye movements compared to the EMDR protocol without eye movements. In sum, the presence or absence of eye movements did not effect physiological measures. Eye movement conditions appeared to be more effective in reducing self report measures of distress than non eye movement conditions. Both conditions were equally effective in treating intrusive thought and dreams. Overall, there was little differential effectiveness in treatment outcome for the non eye movement vs. eye movement conditions.

Renfrey and Spates (1994) investigated the effectiveness of three types of eye movement conditions (standard EMDR eye movements, eye movements through a light tracking task, and eye fixation) in the treatment of 23 PTSD subjects suffering from PTSD as measured by the Clinician Administered PTSD Scale (Blake, Weathers, Nagy, Kaloupek, Klauminzer,

Charney, & Keane, 1990). Subjects were further tested on the SCL-90-R (Derogotis, 1977), and the Impact of Event Scale (Horowitz et.al., 1979) at pre, post, and one to three follow up. Subjects were randomly assigned into one of the three groups noted above. Overall, results indicated that all groups improved significantly pre to post treatment. In terms of the eye movement variations, no group differences were detected, indicating all were equally effective when combined with the rest of the EMDR protocol in treating PTSD. As in the Montgomery et.al. study (1994a), eye movements did not appear necessary for treatment effectiveness.

Bauman and Melnyk (1994) also investigated the treatment of test anxiety through the use of standard EMDR treatment vs. the EMDR protocol with finger tapping replacing eye movements. Dependent measures taken pre and post treatment included the Test Anxiety Inventory (Spielberger, 1977) and SUDs. Data from the thirty randomly assigned subjects indicated that both groups had significantly decreased their SUDs rating during treatment, with neither group differing significantly from the other on this particular measure. TAI scores too, were significantly decreased for both treatment groups, with no significant differences between them. Thus, these results suggest that eye movements are not essential for positive treatment outcome when treating test anxiety.

A study using undergraduate subjects examined differential effectiveness of an eye movement vs. non-eye movement condition across

an expectancy condition (high treatment outcome expectancy vs. low treatment outcome expectancy) (Gosselin & Mathers, 1995).

Undergraduates agreeing to participate in a study on "test anxiety" were pre-screened on the Test Anxiety Inventory (Spielberger, 1977). Subjects mean TAI percentile was 85, indicating high levels of test anxiety. Subjects were randomly assigned into four group: Eye movement-high expectancy, eye movement-low expectancy, no eye movement-high expectancy, non eye movement-low expectancy. Subjects in the high expectancy groups were told that the treatment was a powerful new technique that could lead to significant decreases in test anxiety. The low expectancy groups were told that the new procedure was untested and the experimenters were interested in seeing if it worked. Pre, post, and follow up dependent measures were TAI, SUDs, and VOC ratings. Results indicated significant reductions in SUDs rating for the eye movement groups only. Once again, eye movements were effective in lowering self report measures of distress. Overall, there were no significant effects for expectancy on any measure. At post treatment, there was no significant reductions in TAI measured test anxiety by either group. However, at one month follow up, the TAI detected that both groups now evinced significant reductions in test anxiety. As the non eye movement condition faired as well as the eye movement condition, it appears that eye movements were not necessary to reduce test anxiety.

Another study using an undergraduate non-clinical population

assessed EMDR's effectiveness in lowering public speaking phobia resulting from a specific traumatic speech related incident (Foley and Spate, 1995). Thirty-nine students were recruited through bulletin board and class announcements, and passed a screening for public speaking anxiety as measured by the Personal Report of Communication Anxiety - 24 (PRCA-24; McCroskey, 1982), and the Anxiety Disorders Interview Schedule-Revised (ADIS-R; DiNardo, Barlow, Cerny, Vermilyea, B., Vermilyea, J., Himadi & Woddell, 1985). Subjects scored higher than 18 on the PRCA-24, and answered with at least one "yes" to questions 9a to 9d on the ADIS-R, and did not average below a two on responses estimating physical symptom intensity (ADIS-R 9e 1-12). Dependent measures of this study included the SUDs, ADIS-R, and PRCA-24 scores, in addition to scores on the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1978). In addition to these self report measures, subjects were required to give a speech during which two trained observers (trained to 90% agreement) rated the speakers anxiety level on the Behavioral Assessment of Speech Anxiety (BASA; Mulack and Sherman, 1974). Lastly, heart rate reactivity was measured separately at pretest and at follow up assessment.

Subjects were assigned to one of four groups: standard EMDR treatment, a group exposed to a moving audio stimulus in the place of eye movement, a group who focused their eyes on their hand while they rested on their laps, and a non treatment control group. Subjects were treated in

one to two session, treatment being terminated when SUDs levels indicated low anxiety levels, and VOC rating indicated a high degree of acceptance of new adaptive cognitions. A follow up session occurred one week after the last treatment session in which all measures were again taken. Results indicated significant improvement in SUDs and VOC ratings for all groups, with no significant differences between them. The same was true for the standardized measure PRCA-24. The PRPSA and BASA demonstrated only a trend toward improvements in all groups over the control group.

Physiological measures were not significantly different pre to post treatments for all groups. Overall, eye movement did not appear necessary for treatment effectiveness, and all treatments groups experienced lower public speaking anxiety to a similar degree. The authors posit that the small sample size hindered the ability to detect group differences. They also note that obtaining SUDs and VOC ratings from the control group would have made clearer the effectiveness of all treatments.

Differential Effectiveness of EMDR vs. Other Treatments.

Sanderson and Carpenter (1992) compared EMDR and Image Confrontation (imaginal flooding) on 58 phobic subjects. Divided into two groups, one group of subjects received EMDR followed immediately by imaginal exposure. The other group received the same treatments but in reverse order. Dependent measures were SUDs ratings sampled at pretreatment, after the first intervention, and after the second intervention.

Results indicated significant improvement in SUD ratings for both groups, with no reliable differences between the two, irrespective of order of presentation. The results might suggest that EMD is just as effective as an image-only procedure for treatments using imaginal exposure paradigms. However, these results are questionable given the lack of objective and standardized symptomatology measures. Further, no steps were taken to record standard measures of symptom severity and stability of the subjects before treatment.

Acierno, Tremont, Last, and Montgomery (1994) treated a 42 year old female with two distinct phobias (dead body fear, and fear of darkness) as measured at pre- treatment by the SCID (Spitzer, et. al., 1992). The authors employed a multiple baseline design across fears to compare EMDR, an eye fixation EMDR analogue, and in-vivo exposure treatments. One phobia was treated at a time, with several eye fixation analogue treatments followed immediately by standard EMDR treatment. Dependent measures included a behavioral measure (Behavioral Avoidance Test), physiological measures including heart rate, EMG, EDR, and skin temperature, and self report measures such as the State subtest of the State-Trait Anxiety Inventory (Spielberger et. al., 1970), The Fear of Death Scale (Templer, 1970), and SUDs ratings. Self report measures were recorded prior to, and following both eye fixation and EMDR treatment phases. Physiological readings were continuous except for skin temperature; these readings were taken during

and following the procedures. The authors found little to no between treatment differences on physiological measures. BAT scores for dead bodies improved for the EMDR treatment relative to the analogue no eye movement treatment, but no BAT between treatment differences were noted for fear of darkness. There were no between treatment differences on any other measure including SUDs. To ensure this subject could respond to treatment at all, the authors then exposed her to an in-vivo exposure condition for both fears. This treatment resulted in "dramatic improvement on behavioral and subjective measures, with the exception of the S-TAI, which was moderately improved" (Acierno et. al., 1994, p. 274). Based on these results, the authors conclude that EMDR appears not to differ from a non eye movement treatment procedure in the treatment of these phobias. Further, an in-vivo exposure treatment may produce more significant symptom relief than either treatment.

Vaughan, Armstrong, Gold, O'Connor, Jenneke, and Tarrier (1994b), compared treatment effectiveness of EMDR, Image habituation Training (IHT), applied Muscle Relaxation Training (AMT). IHT requires the subject to listen to repetitive audio presentations of their traumatic event, while recording their cognitions and affects at the same time. This treatment has shown some effectiveness with PTSD sufferers (Vaughan & Tarrier, 1992). AMT (Ost, 1987) is designed to manage and reduce anxiety. All subjects met DSM-III-R criteria for PTSD as measured by a blind rater employing the

PTSD Structured interview (Davidson, Smith, & Kudler, 1989). Subjects were also assessed on the Anxiety Disorder Interview-Revised (ADIS-R, DiNardo & Barlow, 1988), The Hamilton Rating Scale for Depression (Hailton, 1960), the State form of the S-TAI (Spielberger, 1983), the Beck Depression Inventory (Beck, 1978), and the Impact of Experience Scale (Horowitz et. al., 1979). Subjects were assessed at pre treatment, at a wait list reassessment, at post treatment, and at a three month follow up.

On the IES only, the EMDR group demonstrated significantly lower post treatment scores. However, at the three month follow up, all groups had improved over pre treatment levels. On PTSD and depressions scales, all groups demonstrated similar effects in lowering scores. Overall, EMDR appeared to demonstrate greater effects than other treatments on one index, and similar effects as the other treatments on all other measures. However, multiple t-tests (performed despite the absence of a treatment X measurement interaction) may have increased the chance of false positives in this study.

2. EVIDENCE SUMMARY

The empirical issues discussed at the beginning of chapter one can now be reconsidered given the review of EMDR research literature.

Treatment Efficacy.

To varying degrees, numerous studies have found EMDR to be an effective therapeutic technique (Shapiro, 1989a, 1989b; Wolpe & Abrams, 1991; Puk, 1991; Marquis, 1991; Pollicer, 1993; Kleinknecht, 1993; Forbes, Cramer, & Rycroft, 1994; Vaughan, Wiese, Gold, & Tarrier, 1994a; Montgomery & Ayllon, 1994b; Goldstein & Feske, 1994; Wilson, Becker, & Tinker, 1995). While some have failed to detect significant treatment gains through the use of EMDR (Jensen, 1994; Acierno, Tremont, Last, & Montgomery, 1994). In the spectrum of assessment devices employed in EMDR research, positive treatment gains are most apparent on subjective verbal measures (SUDs, VOC). Results measured by standardized self report measures (IES, SCL-90-R, BDI, etc.) are more equivacable. While treatment gains are generally detected with these measures, methodological limitations in study design require these results to be received with some caution. Physiological measures of change (heart rate) almost uniformly detect no changes as a result of EMDR treatments. In sum, EMDR appears to be effective in treating some psychological disorders. However, the

degree of effectiveness is unclear given problematic methodologies employed in some studies.

Protocol Components Responsible for Change.

The research support for EMDR eye movements as the mutative element responsible for positive therapeutic gains as Shapiro (1989a, 1989b, 1995) suggests is meager at best (Bauman & Melnyk, 1994; Hekmat, Groth, & Rogers, 1994; Montgomery & Ayllon, 1994a; Renfry & Spates, 1994; Gosselin & Matthews, 1995; Foley & Spates, 1995). Bauman et.al. (1994) found finger tapping to be as effective as eye movements at treating test anxiety. Montgomery et.al. (1994), Renfry et.al. (1994), Gosselin et.al., 1995), and Foley et.al. (1995) all found eye fixation to be as effective as eye movement in relieving negative symptoms regardless of presenting complaint. (test anxiety, pain, PTSD, etc.) Clearly, eye movements do not appear to be crucial elements responsible for affecting treatment outcome.

Differential Effectiveness of EMDR vs. Other Treatments.

Sanderson & Carpenter, (1992) found EMDR and image confrontation to be equally effective in treating phobias, Boudewyns, Stwertka, Hyer, Albrecht, & Sperr (1993) found that EMDR was no more effective at treating PTSD in Veterans Administration hospitals was than standard mileau treatment. Likewise, Vaughan, Armstrong, Gold, O'Connor, Jenneke, & Tarrier (1994b) found image habituation training and applied muscle relaxation to be as effective as EMDR in the treatment of PTSD. Finally,

Acierno, Tremont, Last, & Montgomery (1994) found in-vivo exposure to be a significantly better treatment for a multi-phobic patient than EMDR was.

Overall, there is some question as to how unique the touted treatment effects attributed to EMDR are (speed of treatment, level of symptom change, durability).

The question of exactly how EMDR effects the change it does is still unanswered. EMDR appears to have a degree of effectiveness comparable to other psychotherapeutic treatments, yet eye movements do not seem to be the mutative element in the treatment protocol. The purpose of this study is to explore an alternative explanation that may account for EMDR related treatment gains, namely, that it is ones level of hypnotizability that mediates the degree of positive response to EMDR. This theory posits that individual differences in the ability to respond to suggestion (hypnotizability) mediates EMDR treatment outcome.

3. HYPNOSIS LITERATURE REVIEW

Definition.

Hypnosis is defined as “a situation in which subjects attempt to rally (usually with the encouragement of a therapist or experimenter) certain cognitive abilities in order to successfully alter normal cognitive functioning in accordance with the given suggestion (Nadon, Laurence, & Perry, 1991). Therefore, whether or not an individual becomes hypnotized is based upon their ability to rally the relevant cognitive abilities, not upon exposure to formal hypnotic inductions. Further, implicit and explicit context demands, beliefs and attitudes concerning hypnosis and the hypnotist, and the degree to which the individual utilizes his\her cognitive skills, all impact the degree of success one has when hypnotized.

Observations that people differ in their general level of responsiveness to hypnotic procedures date back to the 18th century. Attempts to measure hypnotic susceptibility began in the early 19th century with Braid and Bernheim (Zangwill, 1987) leading the way. But it was not until the late 1950's that a rigorously normed and standardized procedure for measuring hypnotizability emerged from the programmatic research of Ernest Hilgard at Stanford University: The Stanford Hypnotic Susceptibility Scales, Forms A, B, and C. While the Stanford Scales (especially Form C) remain

somewhat of a "gold standard" in hypnosis research, many other standardized protocols have been developed in the ensuing years. But all operate from the basic premise that hypnotic responsiveness is best measured by hypnotizing a subject, administering a series of suggestions which are either passed or failed, and adding the number of "passed" items to obtain a score. For example, the Stanford Scales involve administration of an induction along with 12 suggestions including ideomotor suggestions (e.g., an extended arm becomes unbearable heavy and moves down by itself), cognitive suggestions (e.g., amnesia, and perceptual suggestions (e.g., positive visual or auditory hallucination). Specific behavioral criteria are established for obtaining a "pass" score on each of these 12 items. The total number of suggestions is the subject's score. The range of possible scores is thus 0-12, with individuals scoring on the lower end of the spectrum being less hypnotizable, and those at the upper end being more hypnotizable.

This methodological breakthrough enabled researchers and clinicians to more confidently examine the nature of hypnotizability, especially its relative stability. Four important discoveries emerged from this work. First, hypnotic susceptibility is for the most part normally distributed across the population, with almost everyone able to experience hypnosis to some extent. Second, a person's responsiveness to hypnosis is relatively unaffected by the technique used, environmental surroundings, and person of the hypnotist. In other words, the person's ability to be hypnotized

accounts for his/her responsiveness, not the specific techniques used, not the expertise of the hypnotist, not the situational variables surrounding the test administration. Third, hypnotic susceptibility is a personality trait that changes little, if any, across time. Test-Retest reliabilities for hypnotizability scales compare favorable with those of IQ tests. In fact, Piccione, Hilgard, and Zimbardo (1989) reported a 15 year follow-up study which revealed an impressive correlation of .82 between the scores subjects obtained in 1970, and the ones these same subjects obtained in 1985. Fourth, children as young as four years of age can be hypnotized. Hypnotizability appears to increase with age into early adolescence, when it plateaus, perhaps decreasing slightly among the elderly

Hypnotizability and Hypnotic Treatment Outcome.

Research has found that hypnotizability is reliably associated with outcome when hypnotic procedures are used in the treatment of certain types of disorders. For example, several studies have identified a positive correlation between hypnotizability and reductions in chronic pain (E. R. Hilgard, 1975; E. R. Hilgard & Hilgard, 1975; Barabasz & Barabasz, 1989; J. R. Hilgard & LeBaron, 1984). In these cases, highly hypnotizable subjects reported greater pain relief after hypnotic treatments than low hypnotizable subjects. Similar findings were detected for subjects suffering chronic facial pain (Stam, McGrath, Brooke, & Cosier, 1986), and headache pain (van Dyck, Zitman, Linssen, & Spinhoven, 1991).

A significant relationship between hypnotizability and positive treatment outcome for asthma sufferers has also been detected (Ewer & Stewart, 1986; Murphey, Lehrer, Karlin, Swartzman, Hochron, & McCann, 1989). Specifically, individuals with high hypnotic talent respond more favorably to hypnotic interventions for asthma than individuals with low hypnotic talent (as measured by changes in pulmonary functioning, bronchial hyperactivity, subjective measures of symptom evaluation, and objective measures of medication usage).

Skin disorders such as warts are also effectively treated with hypnotic procedures for highly hypnotizable subjects vs. low hypnotizable subjects (Sinclair-Gieben & Chalmer, 1959; Noll, 1988). Simple phobias, too, can be more effectively treated with hypnosis for highly hypnotizable individuals compared to low hypnotizable individuals (Horowitz, 1970; Gerschman, Burrows, Reade, & Foenander, 1979; Gerschman, Burrows, & Reade, 1987).

Thus, hypnotic procedures can be quite effective treatments for those individuals who respond to hypnotic suggestion well vs. those who do not. However, there is some evidence to suggest that individual differences on suggestibility also influence treatment outcomes in explicitly non-hypnotic procedures.

Hypnotizability and Outcome of Non-Hypnotic Treatments.

Bowers (1979) argues that the ability to receive suggestions results from mustering certain cognitive abilities that alter the usual flow of cognitive

functions, thus allowing one to become "uncritically absorbed in the received communication and neither purposefully complying or interfering with its intended effect" (Bowers, 1979, p. 499). Therefore, suggestion is not so much an act of communication, but an act of receiving communication: "This means that *any* communications can serve as a suggestion provided that the person has the hypnotic talent" (Bowers, 1979, p. 499). As a result, highly hypnotizable individuals may respond to waking state suggestions as a function of their hypnotic ability. In clinical situations, these individuals may be aided by techniques and procedures that, while not explicitly hypnotic, implicitly exploit an individuals ability to accept and act upon suggestion. Techniques such as neural linguistic programing (NLP), guided imagery, relaxation therapy, and autogenic training, may be effective for just this reason.

Most studies on hypnosis examine the clinical utility of explicit hypnotic procedures in the treatment of specific disorders. The impact of implicit or waking state suggestions on treatment outcome, when outcome is a function of hypnotic susceptibility, has not been as thoroughly studied. One exception is Benson's (1978) study comparing a relaxation condition vs. a self hypnosis condition in the treatment of anxiety. Results indicated that five of 16 relaxation condition subjects, and six of 16 self hypnosis subjects, showed critical levels of anxiety reductions after treatment. Clearly, group differences were hardly profound. However, when re-analyzing the data with

hypnotic susceptibility as the independent variable, 10 of 21 subjects who were moderately to highly hypnotizable showed reduced anxiety. Only one of 11 low hypnotizable subjects showed similar gains. Thus self hypnosis and relaxation training were equally helpful in reducing anxiety for moderate to high hypnotizables, and quite ineffective for low hypnotizables.

In 1975 Andreychuk and Skriver compared hypnotic analgesia with EMG biofeedback to autogenic training for the treatment of migraine headaches. Analysis revealed no significant group differences in terms of treatment effectiveness. However, regardless of treatment, highly hypnotizable subjects demonstrated a 70% improvement in pain relief, compared to only a 40% gain for low hypnotizable subjects.

Kopp, Skrabski, Mihaly, Buza, & Ratkoczi (1988) treated a group of "anxiety panickers" with standard nonhypnotic treatments. They found that highly hypnotizable subjects improved significantly with non-hypnotic procures over those subjects with low hypnotizability.

These findings suggest that Bowers' theory may have merit. If, as the theory states, inductions or other classical hypnotic procedures are not necessary to produce suggestion effects in subjects with hypnotic talent: "A much sounder criteria for deciding whether the healing effect of any psychological intervention is due to suggestion involves correlating treatment outcome with hypnotic ability" (Nash, 1995, p.2).

If such correlations are positive, it is likely that the treatment examined may be subtly exploiting the subjects hypnotic talent. If negative, then therapeutic gains are not likely due to suggestion per se.

4. COGNITIVE EXPERIENTIAL THERAPY AND ITS RELEVANCE TO EMDR.

In a fascinating study Tosi, Lewis, Rudy, and Murphy (1992) examined the psychobiological effects of Cognitive Experiential Therapy (CET) on hypertension. CET "combines cognitive restructuring, hypnosis, with developmental stages" (Tosi et.al., 1992, p. 275; Tosi, 1980; Tosi & Baisden, 1984; Tosi & Marzella, 1975). CET, therefore, explicitly exploits hypnotic talent in a manner we propose EMDR exploits implicitly.

In this procedure, the authors expand Ellis' (1962) ABC theory of emotional disturbance by expanding "B" (cognition), adding "D" (physiological response), and adding "E" (behavioral response). Cognitive restructuring occurs during hypnosis and progresses through six developmental stages (awareness, exploration, commitment, implementation, internalization, and stabilized behavior). The authors state that in CET, hypnotic trance has been found to amplify the restructuring of negative cognitions, emotional states, physiological patterns of responding, and behavior.

The CET protocol is as follows. The subject is first exposed to the "expanded ABCDE framework" (Tosi et.al., 1992). Following this, the subject is hypnotized and directed to imagine a distressing event and negative or self defeating ABCDE sequences (negative cognitive patterns). Next, the subject is told to vividly imagine these same cognitions, however, this time applying

cognitive restructuring techniques to them. Essentially, this requires the subject to link negative cognitions with more positive and desirable cognitions, affects, physiological and behaviorally patterns. Tosi et.al. (1992) state that a unique benefit of CET is that it "allows for the exploration of ABCDE elements and sequences occurring above or below the threshold of awareness" (p. 225). The authors further state that therapists using CET employ direct or indirect suggestions regarding ABCDE patterns that the subject may not be aware of. The cognitive restructuring process proceeds through the six stages noted before. Specifically: Awareness - the subject visualizes and focuses attention on self defeating and self enhancing cognitive patterns. Self observation, reflection, monitoring, and visualization are all emphasized in this stage. Explanation - through hypnotic imagery cognitive restructuring is applied to identified problematic situations (past, present, future). Commitment - knowing more about their irrational cognitive patterns, the subjects are asked to commit themselves to implementing constructive thoughts and behaviors in real life. Implementation - commitment translated into action. Internalization - the integration of the new, more positive cognitions, affects, physiological and behavioral responses. Behavioral Stabilization - the new patterns of being occur with greater frequency and duration, and are noticeable to the subject.

Subjects in this study were 39 medically diagnosed hypertensives. Subjects were randomly assigned to one of four treatment groups: CET,

hypnosis only, cognitive restructuring only, and a placebo control group. Pre treatment physiological readings, standardized psychological rating of anger, aggression, and anxiety (Common Beliefs Survey II, Besai, 1977; Anger in\Anger out, Harburg, Erfurt, and Havenstein, 1973; Buss-Durkee Hostility Inventory, Buss and Durkee, 1957; State-Trait Anxiety Inventory, Speilberger, Gorsuch, and Lashene, 1969) and hypnotic susceptibility (Harvard Group Hypnotic Susceptibility Scale, Shor & Orne, 1967) measurements were taken. Data was recorded again on these measures at the conclusion of the last treatment session and at a two month follow.

Discriminant analysis results indicated that CET subjects saw substantial gains at the first post treatment measurement compared to other treatments. While not as strong as CET, hypnosis alone impacted more strongly than cognitive restructuring alone, or the placebo at post treatment one. At the second post treatment measurements, CET subjects maintained their gains relative to the other treatment groups. All other treatments effected individual dependent measures to varying degrees, but as a whole, were not as effective at treating hypertension (cognitive, affective, physiological, and behavioral aspects) as CET. No data was provided concerning treatment outcomes and their correlation to HGSHS scores.

This study is discussed in detail due to CET's striking resemblance to EMDR. Both are cognitive-behaviorally based treatments and will, as such, share certain theoretical underpinnings such as restructuring irrational

cognitions into benign forms can lead to symptom relief. They also appear to be distantly related to other cognitive-behavioral treatments such as imaginal flooding, RET, ect.. Further, both are time limited treatments designed to focus on specific troubling events.

However, where EMDR employs eye movements to aid and accelerate information processing, CET uses hypnosis to facilitate cognitive restructuring. CET uses hypnosis "as an added dimension to therapy (that) can facilitate cognitive restructuring by helping clients temporarily suspend critical judgement, distort time, and achieve greater concentration and focus" (Tosi et.al., 1992, p. 283).

CET appears to be similar in form and theory to EMDR, and is an efficacious treatment for a wide range of disorders (hypertension, Tosi et.al., 1992; peptic ulcers, Mosi, Judda & Murphy, 1989; test anxiety, Boutin & Tosi, 1983; self concept and depression in the elderly, Fuller, 1981; self concept and delinquency, Rearden & Tosi; treatment of pain, Murphy, Tosi, & Parisen, 1982; migraine headaches, Howard, Rearden, & Tosi, 1982; anxiety neurosis, Tosi, Howard, & Gwynne, 1982; non assertiveness, Howard & Tosi, 1978; Gwynne, Tosi & Howard, 1978; depression in schizophrenia Rearden, Tosi, and Gwynne, 1977). Thus, it is logical to wonder if both EMDR and CET exploit suggestibility as the prime mutative factor, despite their theoretical assertions otherwise.

As both EMDR and CET are cognitive-behavioral treatment

approaches, then perhaps the cognitive processing elements in both protocols are the common curative component. However, in this study Tosi et.al. (1992) demonstrated that cognitive restructuring alone is not as effective as cognitive restructuring with explicit and implicit hypnotic suggestions. Indeed, that is exactly why the authors included a hypnotic component in CET. Shapiro (1989a, 1989b, 1995) argues that eye movements physiologically facilitate the movement of traumatic material in the information processing pipeline. However, the results from numerous studies (Bauman & Melnyk, 1994; Hekmat, Groth, & Rogers, 1994; Montgomery & Ayllon, 1994a; Renfrey & Spates, 1994; Gosselin & Matthews, 1995; Foley & Spates, 1995) suggest that the inclusion of eye movements are not crucial for eliciting changes in clinical indices. Thus, one may ask if EMDR is implicitly and unintentionally exploiting hypnotic talent in the same manner CET does explicitly.

This brings us to the rationale for this present study. Our overall hypothesis is that the primary mutative component of EMDR is response to suggestion. More specifically, we predict that treatment outcome response to EMDR interventions will be correlated with hypnotizability. That is, subjects will improve to the extent they respond to suggestion. Further, we examine the mutative power of the EMDR eye movements by comparing between-subject outcome from both a standard EMDR eye movement condition and an eye fixation EMDR condition.

5. METHOD AND DESIGN

Subjects.

University of Tennessee undergraduate were recruited for this study. A minimum of 125 subjects (25 subjects per group) were required for this study. Recruiters entered University classes with instructor permission and requested subject participation in the study. Each class, and all recruited subjects in that class, were constituted as one group within the design. For example, all subjects recruited in a specific 1:00 o'clock class were assigned to Group One in the design. The next class and its recruited subjects were assigned to Group Two, and so on. This recruiting procedure did not allow for true random assignment of subjects to experimental groups. As such, this is a quasi-experimental design. Subjects have been recruited and assigned in this manner due to the complex and time intensive nature of the design. Time and resource constraints, coupled with the need for subject cooperation with an experiment that demands a significant commitment from the subject, dictated this recruitment design strategy. Any subjects currently in treatment for speech or public speaking anxiety were excluded from the study.

Measures.

Subjects completed The Personal Report of Communication Anxiety (PRCA; McCroskey, 1982) before and after their EMDR treatment. The

PRCA is a standardized self report measure of communication anxiety and “has evolved as the measure of choice for researcher and practitioner studying communication anxiety” (Foley & Spates, 1995, p. 323). This is a self report measure of speech and communication anxiety that requires approximately five to ten minutes to complete. Subjects responded to questions such as “The thought of giving a speech in public terrifies me” through a 5 point Likert scale with options ranging from “strongly agree” to “strongly disagree”.

In addition, subjects in this study reported their SUDs and VOC levels according to the standard EMDR protocol.

Subjects in all groups but Group Three were assessed for their hypnotizability through The Stanford Hypnotic Susceptibility Scale, Form C (group version) (Weitzenoffer & Hilgard, 1967). The SHSS-C is a 12 item, widely used measure of hypnotic susceptibility that is administered in group format. Its psychometric properties indicate the SHSS-C is a reliable and valid measure of hypnotic susceptibility.

Subject in Group Three were assessed for their hypnotizability through The Stanford Hypnotic Susceptibility Scale, Form A (individual version) (Weitzenoffer & Hilgard, 1967). The SHSS-A is a 12 item, widely used measure of hypnotic susceptibility that is administered in individual format. Its psychometric properties indicate the SHSS-A is a reliable and valid measure of hypnotic susceptibility. The correlation between Form C and

Form A of the SHSS is better than .7.

Design.

There were five groups in this study (see Figure 1). Group One subjects were screened on the PRCA to assess their level of speech anxiety. One week later the class was assessed for their individual hypnotizability levels. Both screenings took place during the subjects regularly scheduled class time. Thus, subjects were assessed in group format. Individuals scoring high in speech anxiety were invited back to receive standard EMDR treatment for their anxiety. Several weeks later, the class the subjects attended was screened for speech anxiety again with the PRCA. This screening, too, occurred while subject attended their regularly scheduled class. For all groups in this study, different experimenters interacted with subjects at each screening and during the treatment, and all experimenters were blind to subject scores on speech anxiety and hypnotizability.

Group Two was identical to Group One but the order of presentation for treatment and group hypnosis was crossed. Group Two subjects were assessed, in group, for speech anxiety. Those scoring high were invited to receive standard EMDR treatment for their anxiety. When all participating subjects in this class\group completed treatment, the class as a whole was assessed for hypnotizability. Several weeks later, the class the subjects attended was screened for speech anxiety again with the PRCA. This screening, too, occurred while subject attended their regular class.

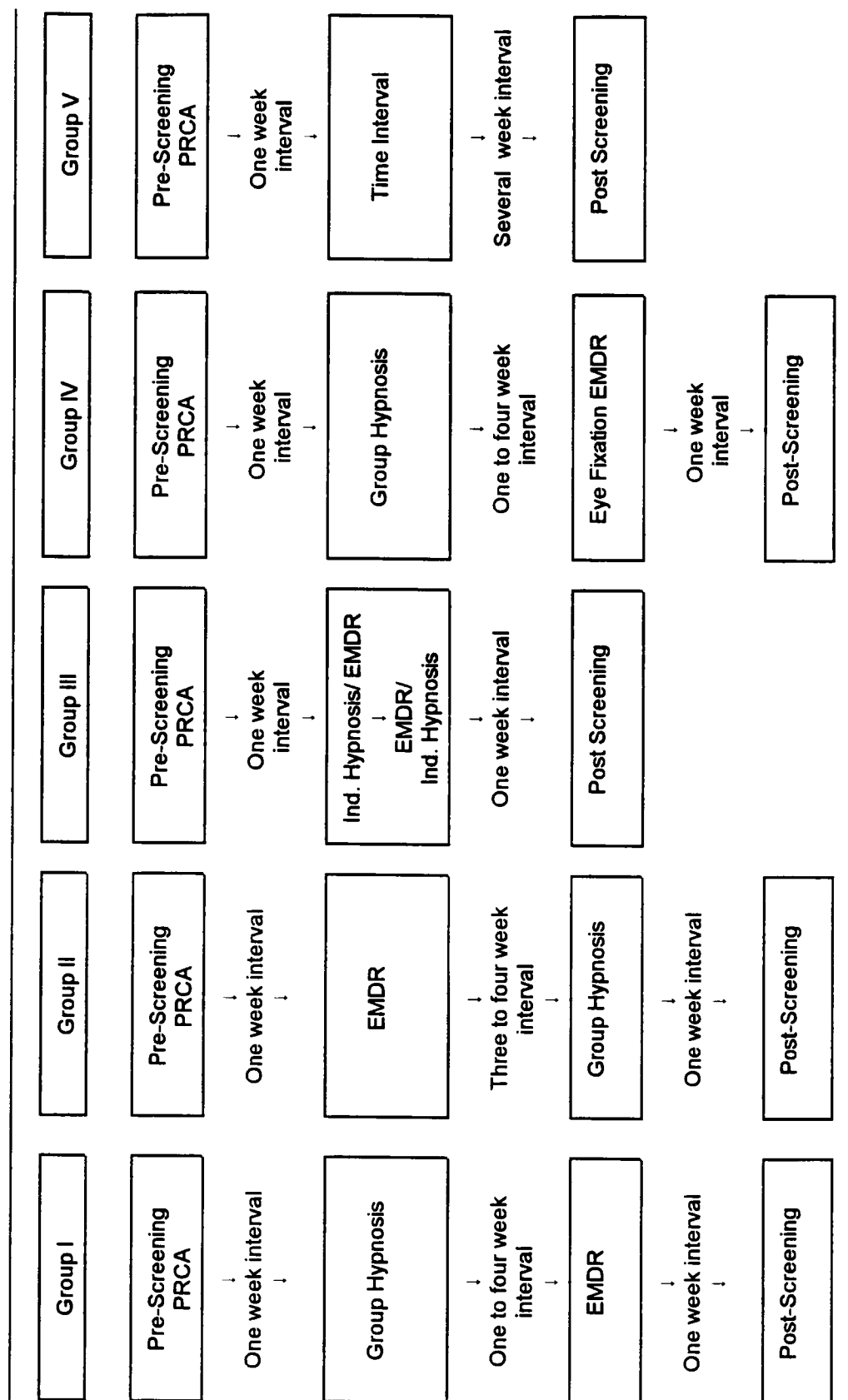


Figure 1: Experimental Design.

Group Three subjects were screened as a class for speech anxiety. Those scoring high were invited to receive standard EMDR treatment for their anxiety. When subjects reported for their treatment, they were also assessed on an individual basis for their hypnotizability. Further, half the subject in this group received standard EMDR treatment first, then were assessed for hypnotizability; while the other half were assessed for their hypnotizability first, then received standard EMDR treatment. When all subject completed their treatment, and several weeks later, the class the subjects attended was screened for speech anxiety again with the PRCA. This screening, too, occurred while subject attended their regularly scheduled class.

Group Four subjects were assessed in class for speech anxiety. One week later, the class was assessed for their individual hypnotizability levels. Subjects scoring high in speech anxiety were invited to receive eye fixation EMDR treatment. This treatment condition replaced eye movements with eye fixation, while maintaining the rest of the standard EMDR protocol exactly the same. When it came time for subjects to do eye movements, they were instead instructed to look at a pre-designated spot on the wall for 30 seconds (the average length of time a course of 24 eye movements takes) while performing the same cognitive exercises (holding the thought, feeling, bodily sensation, etc.) they normally would when doing eye movements. Several weeks later, the class the subjects attended was screened for speech anxiety again with the PRCA. This screening, too, occurred while subject attended

their regularly scheduled class.

Group Five was the control group. This class\group was assessed for speech anxiety in group format. Many weeks later, they were again assessed for speech anxiety to determine if such anxiety remains stable over time. No hypnosis scores were obtained for this group.

Setting.

All individual EMDR treatments took place in one of the University of Tennessee's Psychology Clinic treatment rooms.

Hypotheses.

1. A significant decrease in PRCA scores pre-test to post-test will be demonstrated by all treatment groups. Such changes will reflect a decrease in anxiety associated with communication and public speaking.
2. There will be no significant differences between treatment groups on the PRCA, SUD's, VOC, or hypnosis scores related to context (treatment and hypnosis same session or different session), order of presentation (treatment before or after hypnosis), or treatment type effects (standard eye movement EMDR, eye fixation EMDR, no treatment).
3. The degree to which an individual is hypnotizable will predict their responsiveness to EMDR. In other words, subjects will improve to the extent they respond to hypnotic suggestion. There will be a significant positive correlation between the degree of improvement as measured by the change in pre to post PRCA scores, and the individuals hypnosis score.

4. An individuals hypnotic ability will be positively correlated with the speed to which treatment gains are made. In other words, it is predicted that the stronger a subjects hypnotic ability, the quicker the subject will demonstrate treatment gains as measured by the number of eye movement blocks (or eye fixation blocks) the subject much go through before reaching therapeutic level.

6. RESULTS

Hypothesis One.

A significant decrease in PRCA (Personal Report of Communication Apprehension) scores pre-test to post-test will be demonstrated by all treatment groups. Such changes will reflect decreases in anxiety associated with communication and public speaking (see Table 3).

A series of paired-sample t-tests (2-tailed) were computed for all groups to examine changes between PRCA pre-test and post-test scores (using Bonferroni corrections to control for Type I error). For Group 1 a significant drop in speech anxiety scores was detected $t(23) = 6.66, p < .001$. Group 2 likewise demonstrated a significant drop in speech anxiety $t(15) = 5.93, p < .001$. For Group 3 no significant change in speech anxiety scores were detected. Group 4, however, demonstrated a significant change in scores $t(23) = 4.82, p < .001$. For the control group, Group 5, there were no significant changes in speech anxiety scores pre-test to post-test detected. In this study, speech anxiety scores remained stable over time.

Hypothesis Two.

There will be no significant differences between treatment groups on the PRCA, SUD's, VOC, or hypnosis scores related to context, order of presentation, or treatment type effects.

Table 3

Mean PRCA Pre-Test, Post-Test, and Mean Change Scores for Treatment Groups.

	Pre-test	Post-test	Mean Change
Group 1	98.75	82.25	16.50
Group 2	98.62	80.37	18.25
Group 3	96.14	94.08	2.087
Group 4	98.37	91.29	7.083
Group 5	96.65	96.38	.269

A General Linear Model Univariate Analysis of Variance (UNIANOVA) was employed to determine if group differences existed on the variables SUD's, VOC, hypnosis and PRCA scores across order of presentation (treatment before or after hypnosis), context (treatment and hypnosis same session or different sessions), and treatment type (standard eye movement EMDR, eye fixation EMDR, no treatment condition).

Results indicated there were no significant differences across treatment groups on the variables SUD's, VOC, or hypnosis. For these variables, order of presentation effects, context effects, and/or treatment type had no significant impact.

However, a context effect was detected for PRCA scores, (pre-test to post-test change) $F(1,112) = 27.27, p < .001$. Bonferroni post hoc analyses revealed a significant difference ($p < .001$) in the degree of change reported by subjects receiving EMDR and hypnosis in separate sessions (groups 1,2,4) and those receiving both in the same session (group 3). Specifically, a mean difference of 11.31 (see Table 4) was detected between the change scores of subjects receiving EMDR and hypnosis in separate sessions (M change=13.40) and subjects receiving EMDR and hypnosis in the same session (M change=2.08).

A One-Way ANOVA examining group differences on PRCA scores pre-test to post-test was performed to specify which groups (1,2,or 4) in the EMDR-and-hypnosis-in-separate-sessions treatment category accounted for

Table 4

Context Effect for EMDR/Hypnosis Together vs. EMDR and Hypnosis Separate.

	Mean Change Score Pre to Post	Mean Difference Between Change Scores
Context One: EMDR/Hypnosis Together Group 3	2.08	11.31
Context Two: EMDR/Hypnosis Separate Group 1,2,4	13.40	

the findings reported above. Significant differences between the groups were detected ($F(3,86)=10.08, p<.001$). Bonferroni post hoc analyses revealed a significant ($p<.001$) mean difference of 14.41 between Group One's mean change score ($M= 16.5$) and Group Three's mean change score ($M= 2.0$). Here, Group One subjects received treatment and hypnosis in different sessions while Group Three's subjects in the same session. Likewise, Bonferroni post hoc analyses revealed a significant ($p<.001$) mean difference of 16.16 between Group Two's mean change score ($M=18.25$) and Group Three's mean change score ($M=2.0$). Here, too, Group Two subjects received treatment and hypnosis in different sessions (in crossed presentation order from Group One) while Group Three subjects in the same session (see Table 5). There were no significant differences detected between Group Three and Four.

A treatment-type main effect was detected for PRCA scores, (pre-test to post-test change) $F(1,112) = 8.641, p<.004$. Bonferroni post hoc analyses revealed a significant difference ($p<.001$) in the degree of change reported by subjects receiving standard eye movement EMDR and subjects receiving no treatment. A mean difference of 11.41 was detected between the change scores of subjects receiving eye movement EMDR (M change=11.68) and subjects receiving no treatment (M change = .269). No significant differences were detected on pre-test to post-test scores for subjects receiving standard eye movement EMDR (M change=11.68) and

Table 5

Context One (EMDR and Hypnosis Together) Group Three vs. Context Two (EMDR and Hypnosis Separate) Group One, Two, and Four.

Mean Change Score for:		Group 3 Mean Change Score
Group 1	16.50*	2.08 *
Group 2	18.25**	2.08 **
Group 4	7.083	2.08

* significantly different at the .001 level

** significantly different at the .001 level

eye fixation EMDR (M change=7.08). Nor were differences detected between subjects receiving eye fixation EMDR (M =7.08) and subjects receiving no treatment (M =.269) (see Table 6).

No interaction effects between context, treatment type, and order of presentation were detected.

The relative effect of order-of-presentation, context, hypnosis, and treatment-type on treatment outcome (PRCA scores) was analyzed by examining R-square changes on one variable while holding the other variables constant. Context accounted for appx. 26% of the variance when controlling for order of presentation, treatment type, and hypnosis score. Treatment type accounted for appx. 8.6% of the variance in pre-test to post-test PRCA scores when controlling for order of presentation, context, and hypnosis score. A persons hypnosis score accounted for appx. 8.1% of the variance when controlling for order of presentation, context, and treatment type. Order of presentation did not account for any of the variance in PRCA pre-test to post-test scores when controlling for treatment type, context, and hypnosis scores (see Table 7).

Hypothesis Three.

The degree to which an individual is hypnotizable will predict their responsiveness to EMDR. In other words, subjects will improve to the extent they respond to hypnotic suggestion. There will be a significant positive

Table 6

Treatment Type Comparison of Mean Change Scores.

	Mean Change Score Pre to Post
Treatment Type	
Eye Movement	11.68*
Eye Fixation	7.08
No Treatment	.269*

* groups significantly different from each other.

Table 7

Relative Contribution of Context, Treatment Type, Hypnosis, and Order of Presentation on PRCA Pre-Test to Post-Test Score Variance.

Variable	R-Square Change*
Context	.260
Treatment Type	0.86
Hypnosis	.081
Order of Presentation	0.0

* r-square change on variable when other variables held constant.

correlation between the degree of improvement as measured by the change in pre to post PRCA scores, and the individuals hypnosis scores.

A General Linear Model UNIANOVA analysis was computed to analyze the relationship between treatment outcome and hypnosis across all four treatment groups. Results indicated there was a modest positive correlation between treatment outcome and hypnosis across all four treatment groups ($r(84) = .577$). A regression equation was computed that was able to predict treatment outcome based on a subjects hypnosis score at a significant level ($F(4,84) = 10.02, <.001$).

Hypothesis Four.

An individuals hypnotic ability will be positively correlated with the speed to which treatment gains are made. In other words, it is predicted that the stronger a subjects hypnotic ability, the quicker the subject will demonstrate treatment gains.

A regression equation was computed to predict the speed of treatment outcome (measured by the number of eye movement\eye fixation cycles an individual had to repeat before his SUD's and VOC scores reach final levels) based on an individuals hypnosis score. The regression equation was not able to predict speed of treatment gain at significant levels ($F(1,84) = 1.614, ns$); while the relationship between hypnosis and speed of treatment gain was small ($r(85) = .137$).

Group Three.

Further analyses were conducted post hoc on Group Three due to this groups unusual results when compared to other treatment groups. Group Three demonstrated no significant treatment gains as measured by changes in pre-test to post- test PRCA scores, while all other treatment groups did. Yet, this group had the highest correlation between treatment outcome and hypnosis of any single group ($r(22) = .561$).

Subjects in Group Three were broken down into four levels of hypnotic responsiveness: Level 1 included subjects scoring 0-2, Level 2 = 3-5, Level 3 = 6-8, Level 4 = 9-12 (9 was the highest recorded score for all of Group Three). An ANOVA was computed examining changes in pre-test to post-test PRCA scores across hypnotic levels. A significant difference between hypnotic levels was detected ($F(3,19) = 3.528, p < .035$). Bonferroni post hoc analyses indicated that Level 1 subjects reported a mean change in speech anxiety scores of -5.5 while Level 4 subjects reported a mean change in speech anxiety scores of +16.0. The mean difference between Level 1 and Level 4 change scores ($M=21.5$) was significant at the .035 level.

Similar analyses were then conducted on all other groups. No significant differences between hypnosis levels across PRCA changes pre to post-test were detected.

7. DISCUSSION

Our first hypothesis was generally supported. Groups One, Two, and Four all demonstrated treatment gains associated with EMDR. These findings support the contention that EMDR is an effective treatment for anxiety (Shapiro, 1989a, 1989b; Wolpe & Abrams, 1991; Puk, 1991; Marquis, 1991; Pollicer, 1993; Kleinknecht, 1993; Forbes, Cramer, & Rycroft, 1994).

It is unclear why subjects in Group Three did not respond to EMDR as subjects in the other groups did. Group Three is different from the rest as only these subjects received EMDR treatment and hypnosis in the same session. Only in this group did some subjects (low hypnotizables) actually worsen in terms of PRCA scores (over half the subjects), while others (high hypnotizables) improved markedly. In no other treatment groups did any subjects report increasing anxiety. Further, there is a respectable correlation between hypnotic level and treatment outcome for this group.

We propose the following hypothesis as a possible explanation for Group Three's findings. Subjects in Group Three experienced EMDR treatment and hypnosis in the same session. An individual's performance on one task might impact his/her performance on the next task. If a subject experienced success on the hypnotic or EMDR task (whichever came first for that subject), it is likely they would have a mind set, an expectation, to

perform equally well on the next task. In this case success breeds success. Conversely, if a subject feels they did not perform well on the EMDR or hypnosis task, then they might expect to perform as poorly on the next task. In this case, lack of success breeds lack of success. In this hypothesis, expectations based on previous performance may explain Group Three's results.

Further, as all subjects completed the PRCA weeks after their session, high hypnotizables will likely remember the entire session as successful given their performance on the hypnotic tasks. Thus, their hypnotic success may have influenced their recollections of their EMDR performance, leading to reports of success at lowering speech anxiety. Low hypnotizables, likewise, might remember their sessions as less successful given their inability to respond to hypnotic suggestions. Thus, this lack of hypnotic success may influenced their recollections of their EMDR performance, leading to reports of worsening speech anxiety.

As we did not include measures of expectations, this hypothesis cannot be tested at this time. Future studies examining differences between EMDR treatment with and without hypnosis should attempt to measure and control this factor.

Results pertaining to our second hypothesis point to context and treatment type effects. In terms of context, subjects receiving EMDR treatment and hypnosis in separate sessions reported significantly greater

treatment gains than those subjects receiving EMDR treatment and hypnosis in the same session. Here again, Groups One and Two (separate sessions) differed significantly from Group Three (same session). As discussed above, the effect of including hypnosis within the same context as the EMDR treatment appears to significantly effect treatment outcome.

In terms of treatment type, it appears that replacing eye movements with eye fixation does not significantly impact treatment outcome. In the present study, the standard EMDR protocol with eye fixation was as efficacious in reducing speech anxiety as the standard EMDR protocol with eye movements. This finding supports those of previous studies that found EMDR with eye fixation to be comparably effective in terms of treatment outcome as EMDR with eye movements (Montgomery & Ayllon, 1994a; Renfry & Spates, 1994; Gosseling & Matthews, 1994; and Foley & Spates, 1995). However, the role eye movements play or do not play in treatment outcome is still unclear. There are but a few well designed studies critically examining the role of eye movements, and further study is needed before firm conclusions can be made. Shapiro (1989a, 1989b, 1997) has advanced several neurologically based theories that might explain the role eye movements play in the protocol. At this time, there are no published studies examining these theories.

In terms of our third hypothesis, that hypnotic ability may predict EMDR treatment outcome, the results are equivocal. Across all treatment

groups there is a small but significant correlation between hypnosis and treatment outcome. As no one group accounts for a significant portion of this correlation, we can say that hypnosis is associated with EMDR treatment outcome regardless of context, treatment type, or presentation order. In this study, knowing an individual's hypnotic score will allow you to predict treatment outcome at a statistically significant level.

Our fourth hypothesis, that highly hypnotizable subjects would improve more rapidly than low hypnotizable subjects was not supported. There appears to be a very limited association between hypnotizability and rapidity of treatment gains. Individuals, regardless of their hypnotic talent, improved at generally the same pace.

Summation.

Our results support the body of work finding EMDR to be an effective treatment for various anxiety disorders. Further, our findings suggest that eye movements are not critical for significant treatment outcome. The interaction of hypnosis and EMDR within the same session may result from expectancy playing a stronger than usual role in determining how a subject perceives his response to treatment. Regardless, our findings for Group Three are curious, and call for further exploration of the interaction between within-context hypnosis and EMDR. In this study, hypnosis appears to be modestly associated with treatment outcome, and one can predict EMDR treatment outcome based on a hypnosis score.

In her book, (1995) Shapiro lays out the most comprehensive theoretical explanation of EMDR's treatment effectiveness to date. In this work she states that EMDR's effectiveness stems from, in part, standard cognitive-behavioral principles embedded in the protocol, but more strongly from the neurophysiological changes brought about by the eye movements.

In terms of cognitive-behavioral techniques, Shapiro states that EMDR relies on "dosed exposure" (p.311) effects like many other treatments for anxiety disorders. Further she relates EMDR to the BASK technique (behavior, affect, sensation, knowledge) (Braun, 1988) in that her protocol similarly promotes integration of fragmented aspects of trauma experiences. Her emphasis on alternating negative and positive cognitions related to trauma events and her inclusion of relaxation techniques ("take a deep breath and let your mind go blank) reflect common and widely used cognitive-behavioral strategies for relieving anxiety.

However, Shapiro is strongly wedded to a neurophysiological explanation for EMDR's effectiveness, cognitive aspects notwithstanding. Shapiro argues that she has "stumbled upon an inherent physiological mechanism that influences cognitive processes: (1995, p. 17). Trauma is "encapsulated in a neuro network with a high bioelectric valence associated with the high level of dysfunctional affect (p. 316). The EMDR clinician "catalyzes the appropriate biochemical balance through the interactions of electrical pulses and organic systems" (p. 48) allowing traumatic memories to

be reprocessed into adaptive forms.

Shapiro clearly states her explanations are as yet unproven hypotheses, and that the underlying biochemical processes of EMDR are not fully understood. While on one hand she argues for the primacy of eye movements, she also confusingly states that "eye movements are not unique in producing positive therapeutic effects and that the existence of successful alternate stimuli adds to the versatility of the method".

This statement is confusing as one wonders that if eye movements are unnecessary for treatment gains, how is it that Shapiro bases EMDR's effectiveness so heavily upon eye movements? Indeed she goes on to state that "animal studies have indicated that repetitive low-voltage currents change the synaptic potential that are directly related to memory processing", and that "eye movements may be essentially equivalent to a low-voltage current and therefore responsible for the same synaptic changes (p. 315). Thus, "each kind of movement (change in eye movement direction and speed) has a unique effect on a target network" (p. 319).

Such neurologically based explanations are confusing and cloud the issue of protocol components responsible for change. Several EMDR researchers have commented that EMDR treatment effectiveness can be amply accounted for by the systematic desensitization and exposure procedures embedded in the protocol, and that "much of the technique falls well within the parameters of cognitive-behavioral approaches that have

never needed any neurophysiological justification" (Allen, 1996, p. 253).

The results of this study support such views. We found that the presence or absence of eye movements did not significantly effect treatment outcome. We therefore agree with Allen and suggest that EMDR is a standard exposure-based treatment for reducing anxiety.

For example, Systematic Desensitization is a respondent conditioning technique developed by the psychiatrist Joseph Wolpe (1958, 1973) for relieving anxiety. In this procedure, patients imagine their anxiety-eliciting stimuli under conditions that inhibit the development of anxiety, usually a state of deep muscle relaxation (interestingly, Wolpe frequently used systematic desensitization with subjects after first putting them in a light to medium hypnotic trance). Through repeated pairing of the stimulus with the relaxed state, the stimulus gradually loses its power to arouse anxiety. EMDR is similar as relaxed states (induced at the conclusion of each eye movement set) are paired with anxiety states (eye movements where the patient is to hold the trauma event in their mind) until the patient reports low levels of distress.

Flooding therapy or intense-anxiety-evocation uses the patient's imagination to intensively expose the patient to the conditioned anxiety producing stimulus (trauma event) that is then not reinforced. Continued exposure to the anxiety stimulus causes it to lose all power to evoke anxiety through habituation processes. This leads to the extinguishing of the anxiety

response. Existentialist therapists use a similar technique calling it paradoxical intention. Here the patient is instructed to intentionally bring on anxiety symptoms as intensely as they can. Patients inevitably find it very difficult to do so, experience mastery over their anxiety, and change their beliefs and attitudes towards the anxiety (trauma) stimulus. Again, EMDR mirrors these techniques. The patient repeatedly calls to mind the most intense and painful moment of the trauma event. In fact, the patient is required to recall the event as many time as necessary to bring anxiety levels (SUDS ratings) down (habituation). When low SUDs levels are reached the patient is asked to recall the event again and asked the strength of their negative and positive beliefs about the event. As Existentialist therapists have found, the affect associated with the event is significantly less intense and the patient finds new beliefs about themselves and the event to be more acceptable.

These technique have had a major influence on the development of behavior therapy. They have now been incorporated into behavioral treatments for a vast range of problems, from sexual dysfunction to alcoholism. Indeed, these approaches are often used for any problem in which anxiety is thought to play an important role, much in the way EMDR is being used for an increasingly wide range of anxiety disorders.

The guiding theory behind this study was Dr Bowers' contention that highly hypnotizable individuals may respond to explicitly non-hypnotic

situations that, none-the-less, are laced with suggestion. Dr. Bowers hypothesized that such individuals could profit from their ability to respond to suggestion in situations that were laden with suggestion, but non-hypnotic. We posited that EMDR was just such a situation: A non-hypnotic technique that was laced with suggestions for treatment gains. The results of our third and fourth hypotheses modestly support Dr. Bowers' and our own contentions. There is some indication that hypnotic ability is correlated with treatment outcome. The modest strength of our findings only suggest that highly hypnotic individuals may respond to suggestion outside of hypnotic contexts, and that EMDR is laced with suggestions. Expectancy may play a greater role in explaining our results than hypnotic responsiveness. Future studies examining the relationship between EMDR and hypnosis should address the role of expectancy in treatment outcomes, and broaden the subject pool to include a greater diversity and intensity of anxiety disorders.

REFERENCES

Acierno, R., Hersen, M., Van Hasselt, B. B., & Tremont, G. (1994). Review of the validation and dissemination of eye movement desensitization and reprocessing: A scientific and ethical dilemma. Clinical Psychology Review, 14, 287-299.

Acierno, R., Tremont, G., Last, C., & Montgomery, D. (1994). Tripartite assessment of the efficacy of eye movement desensitization in a multi phobic patient. Journal of Anxiety Disorders, 8, 259-276.

Allen, J. G. & Lewis, L. (1996). A conceptual framework for treating traumatic memories and its application to EMDR. Bulletin of the Menninger Clinic, 60, 238-263.

Andreychuk, T. & Skriver, C. (1975). Hypnosis and biofeedback in the treatment of migraine headache. International Journal of Clinical and Experimental Hypnosis, 23, 172-183.

Barabasz, A. F. & Barabasz, M. (1989). Effects of restricted environmental stimulation: Enhancement of hypnotizability for experimental and chronic pain control. International Journal of Clinical and Experimental Hypnosis, 37, 217-231.

Bauman, W. & Melnyk W. (1994). A controlled comparison of eye movements and finger tapping in the treatment of test anxiety. Journal of Behavior Therapy and Experimental Psychiatry, 25, 29-33.

Benson H. (1978). Treatment of anxiety: A comparison of the usefulness of self-hypnosis and a mediational relaxation technique.

Psychotherapy and Psychosomatics, 30, 229-242.

Boutin, G. & Tosi, D. (1983). Modification of irrational ideas and test anxiety through rational stage directed hypnotherapy. Journal of Clinical Psychology, 39, 382-391.

Bowers, K. S. & Kelly, P. (1979). Stress, disease, psychotherapy, and hypnosis. Journal of Abnormal Psychology, 88 (5), 490-505.

Carrigan, M. H. & Cahill, S. P. (1995). The relevance of the anxiety literature to research on eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 26, 365-366.

Ewer, T. & Stewart, D. (1986). Improvement in bronchial hyper-responsiveness in patients with moderate asthma after treatment with a hypnotic technique. British Medical Journal, I, 1129-1132.

Foley, T. & Spates, R. (1995). Eye movement desensitization of public speaking anxiety: A partial dismantling. Journal of Behavior Therapy and Experimental Psychiatry, 26, 321-329.

Forbes, K., Creamer, M., & Rycroft, P. (1994). Eye movement desensitization and reprocessing in posttraumatic stress disorder: A pilot study using assessment measures. Journal of Behavior Therapy and Experimental Psychiatry, 25, 113-120.

Fuller, J. (1981). Rational stage directed hypnotherapy in the treatment of self concept and depression in a geriatric nursing home population. A cognitive experiential approach. (Doctoral dissertation, Ohio state university, 1981) Dissertation Abstracts International, 43, 241A

Gerschman, J., Burrows, G., & Reade, P. (1987). Hypnotizability and dental phobic disorder. International Journal of Psychosomatics, 33, 42-47.

Gerschman, J., Burrows, G., Reade, P., & Foenander, G. (1979). Hypnotizability and the treatment of dental phobic behavior. In G. D. Burrows, G. D. R. Collison, & L. Dennerstein (Eds.), Hypnosis 1979 (pp. 33-39). New York: Elsevier/North-Holland.

Goldstein, A. & Feske, U. (1994). Eye movement desensitization and reprocessing for panic disorder: A case series. Journal of Anxiety Disorder, 8, 351-362.

Gosselin, P. & Mathews, W. (1995). Eye movement desensitization and reprocessing in the treatment of test anxiety: A study of the effects of expectancy and eye movement. Journal of Behavior Therapy and Experimental Psychiatry, 26, 331-337.

Greenwald, R. (1994). Eye movement desensitization and reprocessing (EMDR): An review. Journal of Contemporary Psychotherapy, 24, 15-34.

Greenwald, R. (1995). Eye movement desensitization and reprocessing (EMDR): A new kind of dream work? Dreaming, 5, 51-55.

Greenwald, R. (1996). The information gap in the EMDR controversy. Professional Psychology: Research and Practice, 27, 67-72.

Gwynne, K., Tosi, D., & Howard, L. (1978). The treatment of non assertion through rational stage directed hypnotherapy, and behavioral rehearsal. American Journal of Clinical Hypnosis, 20, 263-267.

Hekmat, H., Groth, S., & Rogers, D. (1994). Pain ameliorating effect of eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 25, 121-129.

Herbert, J. D. & Mueser, K. T. (1992). Eye movement desensitization: A critique of the evidence. Journal of Behavior Therapy and Experimental Psychiatry, 23, 169-174.

Hilgard, E., R. (1975). The alleviation of pain by hypnosis. Pain, 1, 213-231.

Hilgard, E., R. & Hilgard, J. R. (1975). Hypnosis in the relief of pain. Los Altos, CA: Daufmann.

Hilgard, J., R. & LeBaron, S. (1984). Hypnotherapy of pain in children with cancer. Los Altos, CA: Kaufmann.

Horowitz, S. (1970). Strategies within hypnosis for reducing phobic behavior. Journal of Abnormal Psychology, 75, 104-122.

Howard, L., Reardon, J., & Tosi, D. (1982). Modifying migraine headache through rational stage directed hypnotherapy. International Journal of Clinical and Experimental Hypnosis, 30, 257-267.

Howard, L. & Tosi, D. (1978). The effects of rational stage directed imagery and behavioral rehearsal on assertiveness. Rational Living, 13, 3-8.

Jensen, J. (1994). An investigation of eye movement desensitization and reprocessing (EMDR) as a treatment for posttraumatic stress disorder (PTSD) symptoms of Vietnam combat veterans. Behavior Therapy, 25, 311-325.

Kleinknecht, R. (1993). Rapid treatment of blood and injection phobias with eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 24, 211-217.

Kopp, M., Skrabske, A., Mihaly, K., Buza, K., & Ratkoczi, E. (1988, September). Psychophysiological regulation treatment in two subgroups of panic patients. Paper presented at the 5th International congress of psychophysiology, Prague, Czechoslovakia.

Lohr, J. M., Kleinknecht, R. A., Conley, A. T., Dal Cerro, S. Schmidt, J., & Sonntag, M. (1992). A methodological critique of the current status of eye movement desensitization (EMD). Journal of Behavior Therapy and Experimental Psychiatry, 23, 159-167.

Lohr, J. M., Kleinknecht, R. A., Tolin, D. F., & Barrett, R. H. (1995). The empirical status of the clinical application of eye movement desensitization and reprocessing. Journal of Behavior Therapy and Experimental Psychiatry, 26, 285-302.

Marquis, J. (1991). A report of seventy-eight cases treated by eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 22, 187-192.

McCann, D. (1992). Post traumatic stress disorder due to devastating burns overcome by a single session of eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 23, 319-323.

McCrosky, J. (1982). An Introduction to Rhetorical Communication. New Jersey: Prentice Hall Inc.

Metter, J & Michelson L. K. (1993). Theoretical, clinical, research, and ethical constraints of the eye movement desensitization reprocessing technique. Journal of Traumatic Stress, 6, 413-415.

Montgomery, R. & Ayllon, T. (1994a). Eye movement desensitization across subjects: subjective and physiological measures of treatment efficacy. Journal of Behavior Therapy and Experimental Psychiatry, 25, 217-230.

Montgomery, R. & Ayllon, T. (1994b). Eye movement desensitization across images: a single case design. Journal of Behavior Therapy and Experimental Psychiatry, 25, 23-28.

Murphy, A., Lehrer, P., Karlin, R., Swartzamn, L., Hochron, S., & McCann, B. (1989). Hypnotic susceptibility and its relationship to outcome in the behavioral treatment of asthma: Some preliminary data. Psychological Reports, 65, 691-698.

Murphy, M., Tosi, D., & Paiser, R. (1989). Psychological coping and the management of pain with cognitive restructuring and biofeedback: A case study and variation of cognitive experiential therapy. Psychological Reports, 64, 1343-1350.

Nadon, R., Laurence, J., & Campbell, P. (1991). The two disciplines of scientific hypnosis: A synergistic model. In S. Lynn & J. Rheu (Eds.). Theories of hypnosis: Current models and perspectives, (pp. 485-519).

Nash, M. R. (1995). Personal Communication.

Nicosia, G. J. (1995). Eye movement desensitization and reprocessing is not hypnosis. Dissociation, 8, 69.

Noll, R. (1988). Hypnotherapy of a child with warts. Journal of Developmental and Behavioral Pediatrics, 9, 89-91.

Osen, G. M. (1995). On the origin of eye movement desensitization. Journal of Behavior Therapy and Experimental Psychiatry, 26, 121-122.

Oswalt, R., Anderson, M., & Hagstrom. (1993). Evaluation of the one session eye movement desensitization reprocessing procedure for eliminating traumatic memories. Psychological Reports, 73, 99-104.

Paulsen, S. (1995). Eye movement desensitization and reprocessing: Its cautious use in the dissociative disorder. Dissociation, 8, 32-44.

Pellicer, X. (1993). Eye movement desensitization treatment of a child's nightmares: A case report. Journal of Behavior Therapy and Experimental Psychiatry, 24, 73-75.

Piccione, C., Hilgard, R. R., & Zimbardo, P. (1989). On the degree of stability of measured hypnotizability over a 25 year period. Journal of Personality and Social Psychology, 56, 289-295.

Puk, G. (1991). Treating traumatic memories: A case report on the eye movement desensitization procedure. Journal of Behavior Therapy and Experimental Psychiatry, 22, 149-151.

Reardon, J., & Tosi, D. (1977). The effects of rational stage directed imagery on self concept and reduction of psychological stress in adolescent delinquent females. Journal of Clinical Psychology, 33, 1084-1092.

Reardon, J., Tosi, D., & Gwynne, R. (1977). The treatment of depression through rational stage directed hypnotherapy: A case study. Psychotherapy, Theory, Research, and Practice, 14, 95-103.

Renfrew, G. & Spates, C. R. (1994). Eye movement desensitization: A partial dismantling study. Journal of Behavior Therapy and Experimental Psychiatry, 25, 231-239.

Rosen, G. M. (1996). Level II training for EMDR: One commentator's view. The Behavior Therapist, May, 76-77.

Sanderson, A. & Carpenter, R. (1992). Eye movement desensitization versus image confrontation: A single session crossover study of 58 phobic subjects. Journal of Behavior Therapy and Experimental Psychiatry, 23, 269-275.

Shapiro, F. (1989a). Efficacy of the eye movement desensitization procedure in the treatment of traumatic memories. Journal of Traumatic Stress, 2, 199-223.

Shapiro, F. (1989b). Eye movement desensitization: A new treatment for post traumatic stress disorder. Journal of Behavior Therapy and Experimental Psychiatry, 20, 211-217.

Shapiro, F. (1991). Eye movement desensitization & reprocessing procedure: From EMD to EMDR-R new treatment model for anxiety and related trauma. The Behavior Therapist, 14, 133-135.

Shapiro, F. (1993). Eye movement desensitization and reprocessing (EMDR) in 1992. Journal of Traumatic Stress, 6, 417-421.

Shapiro, F. (1994). EMDR: In the eye of a paradigm shift. The Behavior Therapist, Summer, 153-155.

Shapiro, F. (1994). Shapiro's response (to Steketee & Goldstein). The Behavior Therapist, Summer, 157-158.

Shapiro, F. (1995). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures. New York, Guilford Press.

Shapiro, F., Vogelmann-Sine, S., & Sine, L. (1994). Eye movement desensitization and reprocessing: treating trauma and substance abuse. Journal of Psychoactive Drugs, 26, 379-391.

Silver, S, Brooks, A. & Obenchain, J. (1995). Treatment of Vietnam war veterans with PTSD: A comparison of eye movement desensitization and reprocessing, biofeedback, and relaxation training. Journal of Traumatic Stress, 8, 337-342.

Sinclair-Gieben, A., & Chalmer, D. (1959). Evaluation of treatment of warts by hypnosis. Lancet, ii, 480-482.

Spate, C. R. & Burnette M. (1995). Eye movement desensitization: Three unusual cases. Journal of Behavior Therapy and Experimental Psychiatry, 26, 51-55.

Stam H, McGrath, P., Brooke, R., & Cosier, F. (1986). Hypnotizability and the treatment of chronic facial pain. Internatinal Journal of Clinical and Experiemntal Hypnosis, 34, 182-191.

Steketee, G. & Goldstein, A. J. (1994). Reflections on Shapiro's reflections: Testing EMDR within a theoretical context. The Behavior Therapist, Summer, 156-157.

Tosi, D. (1980). Conceptual innovatons in cognitive experiential therapy (RSDI-H). Paper presented at the Third Annual conference on Rational Emotive Therapy. New York.

Tosi, K. & Baisden, B. (1984). Cognitive experiential therapy and hypnosis. In A. H. Smith & W. C. Wester, II (Eds.), Comprehensive and clinical Hypnosis: A Multi disciplinary Approach. Philadelphia: J. D. Lippencott, (pp. 155-180).

Tosi D., Howard, L., & Gwynne, T. (1982). The treatment of anxiety neurosis through rational stage directed hypnotherapy. Psychotherapy: Theory, Research, and Practice, 19, 95-109.

Tosi D., Judah, S., & Murphy, M. (1989). The effects of cognitive experiential therapy utilizing hypnosis, cognitive restructuring, and developmental staging on psychological factors associated with duodenal ulcer disease: A multivariate experimental study. Journal of Cognitive Psychotherapy: An International Quarterly, 3, 273-290.

Tosi, D. J., Lewis, J., Rudy, D. R., & Murphy, M. A. (1992). The psychobiological effects of cognitive experiential therapy, hypnosis, cognitive restructuring, and attention placebo control on the treatment of essential hypertension. Psychotherapy, 29, 274-284.

Tosi K. & Marzella, J. (1975). Rational stage directed therapy. Paper presented at the First Conference of Rational Emotive Psychotherapy. Chicago.

van Dyck, R., Zitman, F., Linssen, A., & Spinhoven, P. (1991). Autogenic training and future oriented hypnotic imagery in the treatment of tension headache: Outcome and process. International Journal of Clinical and Experimental Hypnosis, 39, 6-23.

Vaughan, K., Armstrong, M., gold, R., O'Connor, N., Jenneke, W., & Tarrier. (1994b). A trail of eye movement desensitization compared to image habituation training and applied muscle relaxation in post traumatic stress disorder. Journal of Behavior Therapy and Experimental Psychiatry, 25, 283-291.

Vaughan, K., Wiese, M., Gold R., & Tarrier, N. (1994a). Eye movement desensitization symptom change in post traumatic stress disorder. British Journal of Psychiatry, 164, 533-541.

Wernik, U. (1993). The role of the traumatic component in the etiology of sexual dysfunctions and its treatment with eye movement desensitization. Journal of Sex Education and Therapy, 19, 212-222.

Wilson, S., Becker, L., & Tinker R. (1995). Aye movement desensitization and reprocessing (EMDR) treatment for psychologically traumatized individuals. Journal of Consulting and Clinical Psychology, 63, 928-937.

Zangwill, O. L., (1987). Experimental hypnosis. In R. L. Gregory (Ed.), Oxford companion to the mind. (pp. 328-330). Oxford: Oxford University Press.

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