Eye movement desensitization and reprocessing in the treatment of test anxiety: a study of the effects of eye movement and expectancy on the procedure's results.

Philip W. Gosselin
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EYE MOVEMENT DESENSITIZATION AND REPROCESSING IN THE TREATMENT OF TEST ANXIETY:

A STUDY OF THE EFFECTS OF EYE MOVEMENT AND EXPECTANCY ON THE PROCEDURE'S RESULTS

A Dissertation Presented

by

PHILIP W. GOSELIN

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

February 1994

School of Education
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My dissertation committee made the dissertation process a pleasurable and rewarding one. My committee chair, Prof. William J. Matthews, provided quick wit, incisive comments and an eye for what was relevant, all of which were greatly appreciated. Prof. Jay Carey’s perceptive critiques were extremely valuable. I would also like to thank Prof. Albey Reiner for his kind presence, as well as his ability to offer a variety of perspectives.

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ABSTRACT

EYE MOVEMENT DESENSITIZATION AND REPROCESSING IN THE TREATMENT OF TEST ANXIETY:

A STUDY OF THE EFFECTS OF EYE MOVEMENT AND EXPECTANCY ON THE PROCEDURE’S RESULTS

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Eye Movement Desensitization and Reprocessing, abbreviated EMDR, is a recently discovered technique acclaimed as a major breakthrough for the reduction of anxiety. Numerous anecdotal studies have been presented showing the efficacy of EMDR. There are currently no published studies investigating use of EMDR specifically for test anxiety.

The purpose of this study was to use the EMDR technique to study its efficacy for test anxiety. This study also examined whether or not high and low expectancy conditions significantly affected scores on post-session anxiety ratings. In addition, the procedure was used with and without eye movement to see whether or not eye movement was a critical factor in eliciting positive change in anxiety ratings.

A single session of approximately one hour was conducted individually with 41 subjects, college students reporting test anxiety. The
subjects were randomly assigned to one of four conditions reflecting varying combinations of eye movement and expectancy conditions. A 2 X 2 analysis of variance was conducted for expectancy and eye movement factors on two dependent measures. These measures were Subjective Units of Disturbance Scale (SUDs) and the Test Anxiety Inventory (TAI).

Results of the study show a significantly greater amount of reduction in the SUDs using the eye movement supporting the hypothesis that eye movement is critical to the efficacy of EMDR. No other statistically significant main effects or interactions were found with measuring the SUDs or TAI. However, it should be noted that all groups showed substantial reductions in post-treatment TAI scores. The expectancy conditions presented to subjects also had no measureably significant effects. There was anecdotal support of the power of the eye movement but no significant behavioral changes other than the reduction in SUDs.

It was concluded that EMDR is worthy of further study with larger samples of the test anxious population. Further study may want to use EMDR in conjunction with other techniques and for more than one session.
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CHAPTER I
INTRODUCTION

The Eye Movement Desensitization and Reprocessing procedure (hereinafter abbreviated as EMDR) was developed by Francine Shapiro, Ph.D. (Shapiro, 1989a). The procedure is claimed to enable rapid and effective treatment of anxiety-related complaints.

During this procedure, the therapist elicits the client's rapid eye movements by having the client follow repeated bilateral movements of the therapist's finger. At the same time as moving the eyes, the client focuses on a traumatic memory, the primary negative thought and emotion associated with the memory and the physical anxiety response being experienced (Shapiro, 1989b). Primary intervention components of EMDR elicit the client's pictorial representation, negative cognitive assessment and sensory response to the past trauma. (For example, a client might remember a particular episode of abuse with a feeling of fear and a sensation of trembling and an accompanying self judgment of "it was my fault that my parents beat me."). After these have been desensitized by the eye movement, more adaptive cognitions (e.g., "It was not my fault.") are paired with the past trauma by using the eye movements while keeping both the adaptive cognition and the past trauma in mind. Shapiro calls this second part of the procedure "reprocessing". Shapiro (1991a) reports that both the desensitization and the reprocessing are necessary for optimal therapeutic effect.

Shapiro (1992c) describes the EMDR procedure as being at present insufficiently investigated. Aside from Shapiro's studies and a carefully
controlled study at the Augusta, Ga. Veterans Hospital (Boudewyns, et al., 1993), a variety of anecdotal studies have been published reporting dramatically positive results (Marquis, 1991; Puk, 1991; Lipke & Botkin, 1992; Kleinknecht, 1992; McCann, 1992). Joseph Wolpe (1991) has also published very positive reports on the use of the procedure and has called for further study.

Given the extremely positive early reports (Shapiro 1992a) of EMDR's efficacy in the treatment of post traumatic stress disorder, multiple personality disorder, anxiety, and phobias, reason to study the procedure is compelling. Previous studies of EMDR have been primarily clinical and anecdotal. It is important now to evaluate the EMDR technique in a controlled environment in order that its claims may be systematically tested.

Shapiro (1992a) and her followers claim that EMDR can "reduce massive amounts of suffering". In the present era of short-term therapy with limitations of insurance, payments, and time, intense interest is likely to be focused on a procedure that claims to make huge positive lasting changes, such as the loss of a particular anxiety or trauma, in one to three sessions. If all or some of Shapiro's findings are replicable, EMDR's demonstrated efficacy might have major implications for the field of counseling itself.

Purpose

The purpose of this study was to evaluate the effect of expectancy and the specific importance of the eye movement in the possible efficacy of EMDR in treating test anxiety. The study also looked at whether or not
male and female subjects report significantly different results with the EMDR procedure.

As Marquis (1991) points out, it is "necessary to show beyond doubt that eye movements are essential to the deconditioning and that not just any simultaneous activity will do." This study tested whether eye movement is the key factor causing reported change in subjects' perception of anxiety.

EMDR results have also been criticized in the past (Hammond, 1991; Metter and Michelson, 1992) as artifacts of expectancy. At present, it is unclear what level of expectancy is presented by most practitioners of EMDR. Conversations in the last year with approximately fifty practitioners reflect a wide range of initial presentations to clients. This study attempted to determine if there are significantly different results using the procedure in two different expectancy conditions.

EMDR treats anxiety based on memories of, or associations to, prior negative experiences. In this study, the EMDR procedure was used with subjects reporting test anxiety. The study considered whether current anxiety level to test taking can be lowered by attempting to relieve the student of prior negative connotations to test taking. However, the purpose of the study was not to determine whether EMDR is the best possible treatment for test anxiety. This study of EMDR's effects on test anxiety was used as a method for determining whether or not EMDR lessens current anxiety from previous memories in subjects. The study also tested whether eye movement is the key factor in possible change and how much expectancy affects self reports of change.
Problem Statement

Key questions for this study were:
1) Does EMDR significantly reduce self ratings of test anxiety?
2) Are the results significantly different with and without the eye movement?
3) Are the results significantly different in different expectancy environments?

Suitability of Test Anxiety as a Target for Testing EMDR

Test anxiety is a specific instance of general anxiety which can be broadly defined as "a set of responses to a class of stimuli that have been associated in the individual's experience of evaluation or testing" (Sieber, 1980). Students with a high level of test anxiety are often unable to study effectively and they perform more poorly on examinations than low test anxious students. High test anxiety can greatly lessen a student's performance on tests, such that the student will not be able to demonstrate the knowledge the student actually does have. Sufferers complain of memory and concentration difficulties. Test anxiety symptoms may also include headaches, insomnia, loss of appetite, vomiting, diarrhea, and dermatitis shortly before an examination (Holroyd, 1976).

Test anxiety has been widely studied in the last forty years, using a variety of psychological techniques for alleviation. Previous treatment approaches studied include systematic desensitization, self-control procedures, relaxation techniques, learning-skills approaches, cognitive
therapies and contextual therapy (Sarason, 1985). However, there have been no reports of the use of EMDR to relieve test anxiety.

Test anxiety is not only a common problem, but has also become one of the most popular target disorders to validate behavioral treatment procedures. Subjects are easily available (i.e., college students) and test anxiety subjects are at relatively low risk for traumatization by psychological interventions (Sarason 1985).

Prior to this study, the investigator used EMDR for one session with a client reporting significant test anxiety. This 12 year old girl reported a major decrease in anxiety and improved test results after one session. She got an A on her next two math tests following the EMDR session. Previous to the session she had gotten a series of D's and F's in math, despite high intelligence and more than sufficient studying. Her teacher had indicated to her parents his belief that test anxiety was the major problem.

**Limitations of the Study**

This study did not attempt to validate or invalidate EMDR as the best treatment for test anxiety. Certainly we need to consider that if the student's anxiety is from lack of study or from an educational impairment, rather than from negative associations with test taking, a desensitization technique may not be as helpful as a learning program or a study technique course. According to Shapiro (1992b), if someone has a reasonable fear, (such as from lack of preparation for a test), it will not be desensitized by EMDR.
This study did not provide an alternative treatment condition or control group, but attempted to determine whether the eye movement and/or expectancy is a key factor in eliciting change and movement in the client's self-perception of test anxiety using the EMDR procedure.

It should be noted that it is not known how much practitioner charisma, transference and practitioner's expectancy affect EMDR results. This researcher was the only therapist in the study, thus making these variables relatively stable. Non-verbal cues of expectancy were avoided as much as possible except as appropriate to presenting high or low expectancy conditions. However, the therapist was not a blind data gatherer and may have had preconceptions about the treatment's validity.

Subjects that volunteered may or may not be representative of the test-anxious population. It is not known how much, or in what ways, the choice of clients affects EMDR results. More importantly, the low number of subjects may not have provided a large enough norming sample, making it difficult to generalize about test anxiety-prone populations.
CHAPTER II
LITERATURE REVIEW

History and Background

The eye movement desensitization effect was discovered by accident by Shapiro in 1987 (Shapiro, 1989a). She reported observing some personal, recurring, disturbing thoughts suddenly disappear following multi-saccadic movements of her eyes that occurred by chance. These thoughts disappeared and, if deliberately retrieved, were no longer upsetting.

Shapiro's first study (1989a), following up on her discovery, was of a rape victim reporting persistent traumatic memories. The results of this study showed that, after a single session of the EMD procedure, the subject showed marked decline in symptoms of anxiety and decreased negative assessment of the trauma. (N.B. The reprocessing element was not added to the procedure until 1991.) The gains of the subject were maintained at a three-month follow up.

In her second EMD study (1989b), with twenty-two subjects reporting persistent negative anxiety provoking images, Shapiro found that the positive effects of the treatment have lasted for several years, with no recurrence of trauma. (It is unclear from the study what percentage of subjects actually had PTSD.) In both her studies the primary measure was the SUDs rating and her results show a dramatic decrease of SUDs to near zero ratings using EMD. (SUDs is a subjective dependent variable consisting of a ten-point scale of subjective units of distress, developed by Wolpe and often used in studies on EMDR.)
Although originally tested for efficacy in treating PTSD (Shapiro, 1989a; Puk, 1991; Wolpe, 1991), EMDR has since been applied to a variety of populations and psychological disorders (Marquis, 1991). These include multiple personality disorder (Fenstermaker, 1991), panic disorder, and phobias, with treatment yielding positive results.

The following table, Table 2.1 (see page 9), taken from Lohr et al. (1992), concisely covers basic aspects of early studies of EMD. The studies covered in this table all show extremely positive results.

Some recent research is not nearly as positive as Shapiro's early studies. Boudewyns (1993) studied 20 Viet Nam veterans at a VA hospital suffering from PTSD. SUDs ratings decreased about 3 in the EMD condition (about half as much as in the Shapiro studies) as compared to a decrease of about 1.5 in the no movement condition. No other significant differences were noted on extensive batteries of psychological tests and psychophysiological measures.

In addition, Sanderson and Carpenter (1992) studied 58 phobics, comparing EMD to a modified flooding technique he calls "image confrontation". These eye movement and no movement conditions yielded roughly similar results. They speculate that the no movement condition in his study was much more efficacious than in Shapiro's study because more time and intensity was spent on particular images.

Shapiro (1993) has responded with criticism of that research. Her main criticism is that SUDs ratings have to drop to 2 or less to constitute a full EMDR treatment and these levels were not reached in recent studies. She also maintains that it is very important that the researcher is trained in EMDR and that the procedure is completely followed.
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>N</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Self-report</th>
<th>Physio</th>
<th>Behavioral</th>
<th>Comments</th>
<th>Immediate post-treatment</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shapiro (1989a)</td>
<td>1</td>
<td>F</td>
<td>Rape trauma</td>
<td>SUD</td>
<td>No</td>
<td>No</td>
<td>EMD/R (single session)</td>
<td>SUD decrease to 0 VOC to 7</td>
<td>3 mo., gains maintained</td>
</tr>
<tr>
<td>Shapiro (1989b)</td>
<td>22</td>
<td>M 5</td>
<td>17, PTSD 5, traumatic memories</td>
<td>SUD VOC</td>
<td>Pulse</td>
<td>No</td>
<td>Placebo group design (N sessions?)</td>
<td>SUD, VOC, PR &amp; complaints decreased significantly—placebo no change improved when treated</td>
<td>1 &amp; 3 mo., gains maintained</td>
</tr>
<tr>
<td>Wolpe &amp; Abrams (1991)</td>
<td>1</td>
<td>F</td>
<td>Rape trauma</td>
<td>SUD</td>
<td>No</td>
<td>No</td>
<td>15 dynamic sessions caused exacerbation—relaxation + EMD for 15 sessions</td>
<td>Symptom free</td>
<td>5 mo.: symptom free</td>
</tr>
<tr>
<td>Puk (1991)</td>
<td>1</td>
<td>F</td>
<td>Childhd sexual abuse</td>
<td>SUD</td>
<td>No</td>
<td>No</td>
<td>Single session</td>
<td>SUD: 100 to 0</td>
<td>12 mo.: only one nightmare</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>F</td>
<td>Trauma due to dying sister/depres.</td>
<td>SUD</td>
<td>No</td>
<td>No</td>
<td>Single session</td>
<td>SUD: 100 to 0</td>
<td>5 mo.: no intrusive thoughts</td>
</tr>
<tr>
<td>Marquis (1991)</td>
<td>78</td>
<td>-</td>
<td>15 different non-psychotic Axis I &amp; II diagnoses</td>
<td>Self-report</td>
<td>No</td>
<td>No</td>
<td>EMD/R</td>
<td>Anxiety adjustment disorders most successful/Axis II, least</td>
<td>1 week to &gt; 1 year</td>
</tr>
<tr>
<td>Kleinknecht &amp; Morgan (1992)</td>
<td>1</td>
<td>M</td>
<td>PTSD assault (8 yr. history)</td>
<td>CESD BSI STAI symptom report narrative</td>
<td>No</td>
<td>Approach trauma sites</td>
<td>8 EMD/R sessions</td>
<td>Clinically relevant decrements on all measures, return to site without anxiety</td>
<td>4 &amp; 8 mo. assessment gain maintained</td>
</tr>
<tr>
<td>Lipke &amp; Botkin (1992)</td>
<td>5</td>
<td>M</td>
<td>Chronic PTSD Veterans subst. abuse</td>
<td>M-PTSD SUD</td>
<td>No</td>
<td>No</td>
<td>Extensive prior treatment</td>
<td>4 of 5 showed &quot;marked decreases in stress&quot;</td>
<td>None reported</td>
</tr>
</tbody>
</table>

Table 2.1: Description of Early Published Studies of EMDR (Lohr, et al, 1992)
How EMDR Works: Theoretical and Practical Explanations

The precise mechanisms by which EMDR works are not known. EMDR has an experiential and accidental origin, and is not based primarily in theory. "There is presently no data-based understanding of any internal changes that could explain the apparent effects" (Boudewyns et al., 1993). Nevertheless, a number of explanations have been advanced. Shapiro speculates that it is a physical response, similar to eye movement in REM sleep, which desensitizes and integrates material such as traumatic memories (Neilsen, 1991). Shapiro (1992c) has overlapped several possible explanations of EMDR into a model that she feels offers useful hypotheses.

Although EMDR is not derived from any particular theory, Shapiro (1992c) is sympathetic to the view of Reiser (1990): "Sensory residues in the mind are organized by affect and arranged by hypothesized nodal memory networks." Affect is seen as the organizing principle of memory. This concept is presented by Chemtob, et al. (1988) thus:

...Parallel structures allow for the multi-level processing of stimuli. These networks and neural switch stations are actually physical structures that are organized at different levels of abstraction/meaning. These nodes are purported to interact at different levels and across levels via mutual potentiation and inhibition. It is the summation of these inhibitions and potentiations that determine whether a node is activated or not. Thoughts, images, behaviors, emotions are all represented in the same networks. Learning may occur via pre-existing nodes or by formation of new ones, providing a means of efficiently processing and formulating survival information, thereby reducing the needed amount of cortical tissue to a reasonable brain-size.
In other words, people have learnings that get translated into feelings, images and sensations. Widely disparate memories can be closely associated through a filing system that, in the interest of efficiency, groups together memories through what may seem like idiosyncratic similarities in specific cognitions, feelings, images or sensations.

For example, a memory may be reactivated by something as innocuous as a similar smell to one that was present during the past traumatic event. Other memories associated with that smell may be clumped together in what can be called a node. When a traumatic memory is desensitized by the EMDR procedure, it seems to activate other parts of the node or network that often spontaneously arise. As those often seemingly innocuous associations (e.g. other times when one was aware of that smell) are desensitized in the procedure, they seem to lose their power to provoke anxiety in the present and in the future.

Shapiro (1992c) also suggests that EMDR can link up two neural networks, a "neural network that can be interpreted as the child's perspective and another neural network, the so-called adult perspective, of accumulated later information and more functional judgment." The painful material is assimilated into its proper place, the past, along with a generalization of the adult's more adaptive cognitions to the previously isolated material. Gannon (1992) calls this explanation a "hodgepodge of information processing theory, stress response theory and Pavlov." It is widely agreed that at present, there are no satisfying explanations of EMDR's effects.
Shapiro also draws parallels between EMDR and REM sleep. She speculates that EMDR has a similar effect to the effects of REM sleep as described by Winson (1990). Winson hypothesizes that REM sleep is a pivotal aspect in the processing of memory, particularly of memories that contain information that may have survival value. According to Winson, REM may be the brain's way of organizing, selecting and filing the information of the previous day for the organism's future use. Winson hypothesizes that the theta rhythm passing through the limbic system during REM sleep also appears in animals at times of survival intensity such as sexual behavior and escaping. Perhaps in both EMDR and REM sleep, rapid eye movements serve to lessen anxiety by facilitating the processing of anxiety-producing memories.

Gabel (1987) theorizes that REM sleep is a way of balancing the activities of the hemispheres of the brain. Eye movement difficulties have been associated with various mental disorders (Ross, et al. 1989; Cartwright 1983). Thus, facilitating REM-like eye movements may decrease anxiety with possible implications for easing mental disorders (McGrath and Cohen, 1978; Foulkes et al., 1989).

Much research (Ross et al., 1989; DeGroen et al, 1990) has been done on the effects of REM deprivation or disorders in causing agitation and anxiety. Karni's recent study (Blakeslee, 1992) concludes that learning was improved by an increase in REM sleep. However, the extent of the similarity in physical action of REM and EMDR is as unclear as the extent of the similarity in their psychological effect. Hedstrom (1991) theorizes that eye muscles are so sensitive that change in their usual control and position might counter how one normally holds
information, creating ambiguity of thought or openness to new associations. Marquis (1991) hypothesizes that eye movements interfere with the connection between the stimulus and the emotional response because field currents generated by eye movements interfere with the tracts connecting the frontal lobes with the hypothalamus and hippocampus.

Shapiro (Foster, 1992) suggests that the emotional potential of eye muscle relaxation, activated at the same time as one remembers the trauma, reinstates the excitatory/inhibitory balance which Pavlov (1927) believed was necessary for optimal information processing. Shapiro (1992b) reports practitioner's feedback that wider and faster movement is more efficacious and that ability to move the eyes more easily in the procedure is perhaps indicative of greater mental flexibility.

It has been suggested (Metter and Michelson, 1991) that the EMDR effect comes from the bilateral movement being equivalent to a strong no signal. Shapiro's (1992c) answer is that different directional movements can be used with the same efficacy. Shapiro has also changed the procedure to use two fingers as the visual target instead of one to seem less like a "no" signal.

The EMDR effect, however, has also been described as being only an expectancy effect (Hammond, 1991). In a similar vein, Metter and Michelson (1991) ascribe a "ruthless structure to EMDR" which would cause strong demand characteristics. Clients might, for example, sense from the EMDR structure that their SUDs rating would have to be very low in order to end the session and fulfill the therapist's expectations.
Balancing these views of EMDR as an expectancy effect are other views that EMDR is too counter-intuitive an intervention to be a placebo and that there is more often a negative expectancy effect. Waters (1993) states that EMDR "fails the common sense test" for him even after hearing of "miraculous results". Hare (1992) also finds EMDR as being counter intuitive. Hare describes what he calls the "huh?" factor of puzzlement on clients' part. This is often evident even when dramatic positive results are obtained. For example, in the researcher's own practice with a PTSD client, the client was quizzical and wary even after excellent results were obtained using EMDR. (Results included immediate disappearance of flashbacks and nightmares, with no recurrence at one year followup.)

Range of Uses of EMDR

Use of EMDR has been developed in a variety of protocols (Shapiro 1992c) for many disorders, (including somatic complaints) and for various populations (including children). EMDR has even been tried with personality disorders, although Axis II conditions seem less tractable to change through EMDR (Gannon 1992).

Least dramatic results have been reported with schizophrenia, obsessive-compulsive disorder and cocaine abuse, although there is one report of a remission in cocaine addiction (Shapiro, 1992b). Shapiro's (1992b) preliminary hypothesis is that all of these conditions exhibit some type of disturbance of the orbito-frontal complex, and are not trauma-based. Therefore EMDR may less directly effect change in those conditions.
EMDR's Relationship to Other Therapy Modalities

Although EMDR seems to have arisen from nowhere, it is important to place EMDR in context with other movements and trends in psychology. There are many aspects to EMDR that reflect other schools of psychology. Shapiro herself (1992a) describes EMDR as "synclectic". According to Shapiro, clinicians using EMDR still need a variety of interventions and skills as well as clinical experience. She notes that EMDR is not a "magic bullet", but uses the image of it being a power tool that opens a stuck faucet.

EMDR uses many behavioral and cognitive interventions. Other therapy modes, such as assertiveness and life-skills training, are seen as important parts of the reprocessing as well. When the negative memories and cognitions are desensitized, positive cognitions and learnings need to take their place (Meichenbaum, 1986).

EMDR has similarities to object relations and psychodynamic approaches in that much of the work is often done with unexpected memories that spontaneously arise from one's early years. However, Shapiro (1992a) counsels practitioners not to push through resistances and to avoid giving interpretation because it slows down the client's healing. The client might be diverted by the therapist's considerations and judgments rather than focusing on the rapid flow of internal changes caused by the procedure.

Shapiro advises practitioners to recognize the importance of systemic considerations. (For example, anxiety may persist for an individual as a way of getting attention in a family or obtaining other
secondary gain.) Her procedure has started to win interest amongst family therapists. For example, in a recent article Braulio Montalvo, a well known family therapist, claims: "Family therapy could never accomplish what EMDR can do, no matter how many times we gather the family." (Markowitz, 1992).

EMDR has similarities to humanistic therapies. Major emphasis is placed on the importance of establishment of an empathic rapport with clients. As in humanistic therapies, Shapiro's emphasis is on the client doing the healing rather than on the brilliance of the therapist's interpretation or intervention. There are no specified routes a client must take in healing, i.e., a lengthy working through of problems may not be necessary. The client is considered the appropriate judge of whether the problem is fully resolved. However, unlike Rogerian therapy, the therapist is specifically trained to not repeat back what clients have said because Shapiro (1992a) considers this distracting to the powerful internal processes set in motion by the EMDR procedure.

In her EMDR model, dysfunctional behavior is considered a learned trauma-based behavior. Most pathologies are seen by Shapiro (1992a) as having an experiential base. It is considered more useful to look at the client's learned lessons and skill development rather than get overly involved in global diagnoses which will seem more like immovable mountains to both the therapist and the client.

Shapiro (1992a) also claims to see wide-spread evidence that positive cognitions (e.g., "I'm okay the way I am.") tend to get stronger using EMDR, while negative cognitions (e.g., "I'm defective.") tend to
get weaker. Shapiro sees this as a connection to Maslow's view that people are naturally oriented to growth.

It should be noted that EMDR also has some similarity to Gendlin's (1981) focusing technique. In both techniques, the client fully focuses on a representative image and feeling that changes in session as a positive image/cognition is added to the original memory. Shapiro (personal communication, 1992) however, was unfamiliar with this technique.

EMDR has also been compared to a variety of psychophysiological interventions such as NLP (Hammond, 1991), hypnosis (Metter and Michelson, 1992) and yoga eye exercises (Hedstrom, 1991). Perhaps the movement of the eyes breaks up usual emotional responses (Hedstrom 1991), somewhat similarly to how abdominal breathing affects psychological symptoms. Wilson's (1991) behavioral interpretation is that EMDR is a type of reciprocal inhibition pairing distress with "compelled relaxation". A recent psychophysiological technique for rapid reduction in anxiety developed by Roger Callahan (1985) also emphasizes the power of eye relaxation. Callahan (personal communication, 1993) sees possible similarities to EMDR.

Although EMDR is so new as to be potentially dismissed as "a flash in the pan" (Hammond 1991), similar effects have long been noted. Jacobson (1942), the promulgator of progressive relaxation, noted the powerful effects of eye relaxation on general relaxation. Teitelbaum (1954) also noted strong correlations between eye movement and therapeutic effects decades ago.
Ellsworth Baker, a disciple of Wilhelm Reich, developed a concept of ocular armoring in the 1960's that has many similarities to EMDR. Baker quotes Barbara Goldenburg, a fellow Reichian, with the following description of the power of eye movement:

I noted that if one has a child or adult patient follow a target such as a pencil, moved randomly ten inches in front of the eyes, there is frequently a strong emotional reaction after about fifteen minutes. A shorter time span may elicit nothing. This does not seem explainable by fatigue alone. Following this maneuver, one can often elicit strong affective reactions in patients -- reactions which used to take months of painstaking work to recover. If a pen light is substituted as the target, the added factor of direct photic stimulation on the brain markedly intensifies the patient's reaction.

After fifteen minutes of such stimulation, I have sometimes obtained spontaneous abreactions. There is almost always a sharp increase in affective responses and the release of unconscious material. One has the impression that the organism feels more integrated and therefore 'safer' in letting go of the holding...Using this approach...two students, one a college physics major and the other in high school, both went from failing grades to honor grades in the space of three months. One reported 'a clearing in my head for the first time in months and a new-found ability to grasp and assimilate what was taught in class...A word of caution regarding use of the light: there is no substitute for empathic contact with the patient. If the light is used as a mechanical gimmick, it will accomplish nothing. (Baker, 1963, p. 78)

EMDR has been derided as just another hypnotic induction technique (Rosen, 1992). Certainly eye movement has long been widely used for hypnotic induction. The sign for hypnosis in deaf signing is of a hand swinging like a pendulum which seems to reflect a common perception of hypnosis. Although, there is little literature about the efficacy in hypnosis of the injunction to "follow the swinging watch", historically it is part of a long tradition. Braid, who coined the term "hypnosis" one hundred fifty years ago, used an induction in which
subjects followed his movement of a shiny scalpel case with their eyes. Well-known writers on hypnosis such as Spiegel and Spiegel (1978) still recommend an eye roll relaxation induction technique. EMDR may be similar to these hypnotic inductions in terms of distance (12-14 inches) from the subject's face and speed of the swinging motion as well as in its use of pendulum like motions.

Training and Presentation of EMDR

Shapiro has been teaching workshop programs in EMDR for the last three years. At present, Shapiro has trained approximately five thousand professionals in the procedure. Currently, only licensed mental health professionals or students under supervision are allowed in the trainings. Shapiro also requires that participants sign agreements that they will not teach EMDR on the basis of their workshop experience. Her reasoning (Shapiro 1991b) is that it is important for purposes of client safety and avoidance of possible retraumatization until replication studies substantiate the effectiveness of the procedure.

Shapiro has been accused of over-emphasizing possible risks as a way of maintaining a lucrative teaching monopoly of the procedure (Johnson, 1992; Metter and Michelson, 1992; Rosen, 1992). Johnson (1992) has challenged her to produce clear evidence of significant risks, saying he sees no evidence of it in his practice.

It is notably difficult to reconstruct the full specifics of the technique from the workbooks, the research articles or even from the trainings. Part of this may be deliberate to keep it unavailable to potential users outside the EMDR network. However, there seems to be
a problem with the vagueness and complexity of the procedure even with trained practitioners. For example, Lohr et al. (1992) and Leeds (1992) report therapists' difficulties with development of appropriate relevant positive cognitions. The EMDR procedure itself, formerly called EMD, added the "R" (reprocessing element) only in 1991. Previous protocols have been presented as representative of EMDR and then abandoned (e.g., Fenstermaker's EMDR protocol for MPD was hailed and then jettisoned by Shapiro in 1993). Perhaps some of these changes represent a new technique in early stages of experimentation. At the same time, it is then difficult to maintain, as does Shapiro, that the technique should only be done as her organization prescribes.
CHAPTER III

METHOD

Subjects

This research was an anxiety-reduction study of forty-one subjects reporting significant test anxiety. Subjects each completed a pre-session self-evaluation of test anxiety. The Test Anxiety Inventory, abbreviated TAI, (Spielberger, 1977) was used as a pre- and post-treatment measure. All those not above the median in test anxiety ratings of the Test Anxiety Inventory were screened out of the study. Five potential subjects were screened out because of low TAI score. Spielberger (personal communication, 1993) estimates that students scoring above the 75th percentile on the TAI suffer from high test anxiety. The average TAI score of the subjects in this study averaged above the 85th percentile.

Subjects were also screened for heart problems, epilepsy, medications, pregnancy, substance abuse, obvious mood or anxiety disorders, recent loss or compounding trauma, or present treatments for test anxiety. These conditions made subjects ineligible for this study, but no one was screened out for any of these reasons. One student was screened out of the study because he was extremely reticent about giving numerical ratings of his anxiety.

Students were recruited to participate in this test anxiety reduction study through brief classroom introductions in a large introductory microbiology class, an education class, a human development class and
an introductory chemistry class at the University of Massachusetts Amherst. Subjects were not paid or offered any other inducements.

A wide variety of majors (20 majors) were represented. Most widely represented were education (6) and psychology (6). There were 7 freshman, 18 sophomores, 5 juniors, and 11 seniors. Average age was 21.1 with a range of 18 to 46. Ten subjects had been in counseling previously but currently none were in counseling, stress reduction programs or study skills courses.

While there is always the possibility of retraumatization when using a relatively unknown technique, the study worked with a relatively high functioning group (undergraduate students) suffering from a relatively mild anxiety (as contrasted to the PTSD conditions that have been studied in previous research of EMDR).

Subjects were informed of availability of counselors at Berkshire House and University Mental Health Services at UMass for further counseling about test anxiety. One subject followed up on this information to start such counseling before post-test and thus, was then dropped from this study.

Subjects were ensured of anonymity. Subjects were told that they could withdraw at any time and that any or all information gathered from a subject could be deleted from the study.

**Design of Study**

The design of this study was a $2 \times 2$ analysis of variance. The EMDR hypothesis is that the rapid eye movements (called saccades) are important variables in the efficacy of the EMDR procedure and in the
relief of trauma. Two factors were examined in this study to determine their impact and criticality in the EMDR procedure:

1) eye movement (the full EMDR procedure) versus no eye movement (the EMDR procedure minus the eye movements),

2) high expectancy (statements eliciting high expectations for the treatment were given to subjects) versus low expectancy (statements eliciting low expectations were given to subjects).

Groups shown in the following table, Table 3.1 (see page 24), were considered as:

1) the low expectancy group receiving treatment without eye movement,

2) the low expectancy group receiving the full treatment reflects the treatment effect while,

3) the high expectancy group receiving treatment without eye movement reflects an expectancy effect and,

4) the high expectancy group receiving full treatment reflects a combined effect of treatment and expectancy.

In Table 3.1, two independent variables are distinguished: the movement of the eyes and expectancy suggestions. Included in the table are the numbers of subjects in each condition, also including the numbers of subjects by gender. Although no research has yet suggested a gender difference in response to EMDR, differences in how men and women respond to the treatment conditions were also considered. However, low numbers of males, evident in this table, made problematic any significant differentiation of mean scores by gender (as discussed in Chapter V).
Table 3.1
2 x 2 Anova Design of Study

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Eye Movement</td>
<td>3</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(10)</td>
<td>(12)</td>
<td>(22)</td>
</tr>
<tr>
<td>No Movement</td>
<td>2</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>(10)</td>
<td>(9)</td>
<td>(19)</td>
</tr>
<tr>
<td>Overall</td>
<td>5</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(20)</td>
<td>(21)</td>
<td>(41)</td>
</tr>
</tbody>
</table>

**Dependent Variables**

A dependent measure in this study was the change in the client's self-reported Subjective Unit of Disturbance Scale (SUDs). This scale, developed by Joseph Wolpe (1982), was used during the treatment. SUDs is used as the primary measure of anxiety by Shapiro in her technique, and in her studies and also in most studies of EMDR. It is a self report
scale of 0 to 10, with 0 reflecting no anxiety and 10 reflecting maximum anxiety.

SUDs was used at intervals during the treatment session to determine whether clients perceived significant change in memories and feelings associated with test anxiety. It was also used to measure pre- and post-treatment level of anxiety.

The Test Anxiety Inventory, abbreviated TAI, (Spielberger, 1977) was also used as a pre- and post-treatment measure. This inventory has been translated into numerous languages and is the most widely used measure of test anxiety. This inventory consists of 20 questions for which subjects have to rate how often they experience the symptoms listed. For example, "During tests I feel very tense: " 1-Almost never, 2-Sometimes, 3-Often, 4-Apulsion always. Therefore scores range from 20 to 80. (Other symptoms listed include "I feel my heart beating very fast during important tests" and "the harder I work at taking a test, the more confused I get.")

EMDR Protocol

Because of the complexity of the EMDR procedure, there is often confusion about the particulars of the protocol. Shapiro (1993) has complained about how the procedure has not been fully followed in many research experiments. Therefore, the procedure used is described here in detail.

The following steps constitute the protocol for treatment of groups one and two, (steps fifteen and seventeen were slightly different between the eye movement and no movement groups, step five was slightly different for the two different expectancy groups as previously described).
This protocol is derived from the Level I and II trainings conducted by Dr. Francine Shapiro in the fall of 1992 and from the workbooks distributed therein.

1) Check with subject for any contra-indications to procedure e.g. ocular disorder, inability to track movements. as well as other contraindications such as epilepsy, heart condition or other serious medical condition, pregnancy, being in counseling at present, other recent traumas.

2) Check whether subject would be able to handle possible mid-session distress when anxiety may increase rather than decrease. The subject needs to understand that there may be several days of reprocessing afterward in which unexpected emotions, sensations or memories may arise.

3) Obtain relevant subject history: initial incident of test anxiety, symptoms now, possible reinforcement for symptoms and parallels between past and present incidents

4) Establish rapport with subject, establishing a sense of safety.
   Explain the upcoming sequence of events and show hand signal for subject to stop the procedure if desired at any time.

5) Give simple theory explanations: Briefly explain to subject, congruent with subject's level of sophistication, the rationale for the EMDR procedure.

6) Subject will choose, in conjunction with the investigator, a memory of a past occurrence of significant discomfort of test anxiety, e.g. when most anxious about test taking in the past - at the moment of test
being distributed, at moment of receiving test results, etc. The memory needs to be representational of the general test anxiety.

7) The earliest, and most recent memories of test anxiety will also be targeted.

8) Instruct the subject that "as we do the procedure, the image may or may not change. I may ask if something else comes up, which it may or may not. Just let whatever happens, happen." (EMDR Level I Manual 1992) The subject will be told that there are no correct responses.

9) The therapist will find a negative cognition held by the subject that is a negative self-assessment associated with this image, asking, e.g., "What words about yourself or the incident best fit the image? Is there a particular thing you say about yourself about this image? Is there a negative conclusion about yourself?"

10) The therapist will help the subject find a relevant positive cognition (referred to in EMDR as the Positive Self Statement or PSS), perhaps opposite to the negative cognition found, with a possible new belief statement reflecting a desired feeling state, (e.g. negative -- "I'm unworthy," changing to positive -- "I did the best I could.")

11) Using a scale of 1-7, 1 being totally untrue, 7 being totally true, have the subject rate the truth of their belief in the positive cognition when they think back to the target image. This Validity of Cognition (VOC) Scale was developed by Shapiro (1992a) for use in the procedure.

12) The therapist will help the subject find and define the most intense emotion attached to the memory.

13) The subject will describe any particular body sensations while remembering the target image.
14) Take a SUDs rating as the subject thinks about that memory, emotion and recalls the image.

15) Desensitize the subject by presenting a series of sets of therapist's hand movements for the subject to track with their eyes as they remember the past image and accompanying emotion and physical sensation. Each set will consist of an average of twenty-four bi-directional saccades, but length of sets will be adjusted depending on client's concentration, resistance or fatigue. At the end of each set (approximately 25 seconds) the subject will be instructed to "blank it out, relax, take a deep breath". They will then be asked, "Did the picture change? Did anything else come up? What are you experiencing now?" Both low and high expectancy subjects will go through all the above procedures.

16) This process will then continue with the changed or unchanged image/emotion/sensation the subject is holding. As long as there are changing responses, the process will continue. Specifics are talked about later, (e.g. what comes up for the subject at a particular time). Participants may notice different images, emotions, physical sensations that may come up and change during the procedure.

17) If the subject reports no change, the therapist may change direction, speed or length of saccades. (Shapiro's trainings also suggest practitioners consider using a variety of directions of eye movements such as up/down and diagonal eye movements and even circular, semicircular or figure 8 as well as side to side movements. Grainger (1992) speculates that differing directions and speeds have slightly differing effects.)
When the image is no longer changing, the subject will be asked to return to the original image and to start the process again. This time when the image does not change, the therapist will check SUDs level. The subject will then use that SUDs level as something to concentrate on while another set takes place. (Test anxiety will be treated as a "process" phobia as Shapiro terms more complex phobias- earliest, worst, most recent incidents will be desensitized as well as an imaginary "video" of a future incident).

18) Now the therapist will have the subject hold in mind the positive cognition while also holding in mind the original material, doing at least one set in that condition. Both low and high expectancy, eye movement and no eye movement subjects will do this procedure.

19) The therapist will check the new VOC level of the new cognition. If it is not at a high level, (5-7), the subject will continue with further sets on original material, or on any blocked or stuck feelings, or on the change in feeling about the original material.

20) The therapist will have the subject note whether or not there are any particular or unusual body sensations. If there are, sets will be done on those symptoms as well.

21) Debrief the subject, allowing for discussion of any material that may have come up during the session.

22) Have the subject keep a log of cognitions, dreams, memories, feelings, thoughts around the session that may arise during the following week. Ask them to call the therapist if they feel any need to discuss the session.
Procedure

Subjects were randomly assigned by a colleague of the investigator to one of four groups, keeping gender ratio as balanced as possible. In each of the first two procedures, there was a high expectancy and a low expectancy group to test for expectancy effects and experimental demand characteristics. The high expectancy sub-groups received the following introductory statement from the colleague arranging the scheduling: "This is a powerful new technique that has had remarkable positive results. People often completely lose their anxiety in a session or two." The low expectancy subgroups were told: "This is a new procedure we know very little about or even if it works. We are interested to see what your experience will be." The researcher was blind as to which expectancy condition had been given to the subjects until after the post test.

Subjects in the first group received a sixty to ninety-minute EMDR session, based on the previously described protocol. Although told it would be a ninety-minute session, all sessions for both conditions were approximately 60 minutes in length, similar to Shapiro's studies (Markowitz 1992).

Subjects in the second group received the exact same procedure, the only difference being that the therapist's fingers remained stationary when presented, thus eliciting no eye movement. These subjects looked at the unmoving fingers for the same amount of time (approximately twenty five seconds per round) as the first group looked at the moving fingers.

Immediately after treatment, all subjects were asked the following questions:
1) What did you think of the procedure in general?
2) What in particular was helpful or unhelpful for you?
3) Was there anything unusual about it for you?
4) Were there any difficulties? What did you like? Not like?
5) Did this treatment make you more anxious or relaxed at any point during or after the treatment?
6) What do you think the investigator thought of the technique?

All subjects were contacted one month after treatment. No reports on EMDR to date indicate need for waiting times for the therapy to take full effect. Numerous reports have reported the initial effects as stable over time of months or even years (Marquis 1991, Shapiro 1989a, Wolpe 1991).

All subjects again completed a Test Anxiety Inventory and were also asked the following questions at that time:

1) What did you think of the procedure in general?
2) What in particular worked for you? What didn't work? Did this treatment make you more relaxed during or after the session?
3) Was there anything unusual about it for you?
4) Were there any difficulties? what did you like or not like about the session?
5) Did this treatment make you more anxious at any point during or after the treatment?
6) Would you recommend this treatment to your friends?
7) Did this treatment help you cope with other problems as well as test anxiety?
8) Were there any changes in how you did academically or how you took tests?

At that time, they were also asked if there was any generalizing effect in possible lessening of anxiety in other areas of their lives. After the one-month follow-up was completed, "no movement" (NM) subjects were also offered the full "eye movement" (EM) treatment.

**Researcher**

The researcher in this study was a master's level clinician who had been supervised for the last three years by a licensed psychologist, while giving clinical treatment in an outpatient clinic for a spectrum of anxiety disorders as well as a variety of other disorders. The researcher had completed the two EMDR trainings available for mental health professionals (presented by Shapiro, September and October, 1992).

Previous to this study, the researcher used the EMDR procedure with approximately thirty clients suffering from a variety of conditions such as anxiety, phobia, and disturbing memories reflecting PTSD. The researcher has seen some dramatically positive effects in subjective reports of decrease in anxiety and no reported adverse effects other than several reports of feeling temporarily unsettled by examination of past difficulties and unexpected memories arising.
CHAPTER IV
RESULTS

This study was a 2 (eye movement vs. no movement) x 2 (high expectancy vs. low expectancy) analysis of variance (ANOVA) design. The analysis shows a significant change in SUDS ratings comparing eye movement to no movement. \( F = 9.46, \ df= 1, \ p < .01 \). In this one important category, eye movement (EM) had significant difference to the no movement (NM) condition. This was the only significant difference that could be found for either factor. There were no other main effects or significant interactions.

**Self Report Ratings of Anxiety**

Subjective Units of Disturbance (SUDs) are a self report scale designed to measure change in anxiety levels. Previously published studies have reported SUDs decreases after EMDR sessions. Results in this study also showed a significant decrease in SUDs although not nearly as large as obtained in Shapiro's studies. Table 4.1 shows a decrease in SUDS with eye movement treatment compared to almost no decrease with the no movement condition. It is worthy of note that in the NM condition almost half of the subjects showed an increase in SUDS while only one of the EM subjects showed an increase.
Table 4.1
Mean Change in SUDs Ratings by Group

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Movement</strong></td>
<td>-1.55</td>
<td>-1.96</td>
<td>-1.77</td>
</tr>
<tr>
<td></td>
<td>SD = 1.72</td>
<td>SD = 1.20</td>
<td>SD = 1.44</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 12</td>
<td>N = 22</td>
</tr>
<tr>
<td><strong>No Movement</strong></td>
<td>-0.20</td>
<td>0.06</td>
<td>-0.08</td>
</tr>
<tr>
<td></td>
<td>SD = 2.08</td>
<td>SD = 2.05</td>
<td>SD = 2.02</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 9</td>
<td>N = 19</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>-0.88</td>
<td>-1.10</td>
<td>-0.99</td>
</tr>
<tr>
<td></td>
<td>SD = 1.99</td>
<td>SD = 1.88</td>
<td>SD = 1.91</td>
</tr>
<tr>
<td></td>
<td>N = 20</td>
<td>N = 21</td>
<td>N = 41</td>
</tr>
</tbody>
</table>

The SUDs change scores reported in Table 4.1 are derived from the difference between the pre- and post-session SUDs ratings. Those pre and post session SUDs ratings are shown in Table 4.2 (see page 35).
Table 4.2
Mean SUDs Ratings Pre- and Post-Treatment

<table>
<thead>
<tr>
<th>Eye Movement</th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>Eye Movement</td>
<td>7.25</td>
<td>5.70</td>
<td>6.29</td>
</tr>
<tr>
<td></td>
<td>SD = 1.40</td>
<td>SD = 2.12</td>
<td>SD = 1.71</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 10</td>
<td>N = 12</td>
</tr>
<tr>
<td>Overall</td>
<td>6.38</td>
<td>5.50</td>
<td>6.31</td>
</tr>
<tr>
<td></td>
<td>SD = 1.83</td>
<td>SD = 2.21</td>
<td>SD = 1.68</td>
</tr>
<tr>
<td></td>
<td>N = 20</td>
<td>N = 20</td>
<td>N = 21</td>
</tr>
</tbody>
</table>

The pre-session SUDs ratings of discomfort in thinking back on the memory averaged only 6.4 for the entire subject population (Table 4.2).
However, subjects rated the level of discomfort (Table 4.3) at the time of the worst test anxiety incident at almost 9. In other words, subjects were very anxious at the time of the incident and not as anxious now thinking about it. Perhaps this difference is greater than might be seen with PTSD from major traumas. The memory evokes less anxiety as measured by SUDs than described in Shapiro's studies on PTSD subjects, and there is less measurable anxiety to be reduced at the start of the session.

Table 4.3
Mean SUDs Ratings of Discomfort at Time of Worst Test Anxiety

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Movement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.00</td>
<td>8.83</td>
<td>8.91</td>
</tr>
<tr>
<td></td>
<td>SD = 0.94</td>
<td>SD = 1.13</td>
<td>SD = 1.03</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 12</td>
<td>N = 22</td>
</tr>
<tr>
<td><strong>No Movement</strong></td>
<td>8.50</td>
<td>8.56</td>
<td>8.53</td>
</tr>
<tr>
<td></td>
<td>SD = 1.29</td>
<td>SD = 0.98</td>
<td>SD = 1.12</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 9</td>
<td>N = 19</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>8.75</td>
<td>8.71</td>
<td>8.73</td>
</tr>
<tr>
<td></td>
<td>SD = 1.13</td>
<td>SD = 1.06</td>
<td>SD = 1.08</td>
</tr>
<tr>
<td></td>
<td>N = 20</td>
<td>N = 21</td>
<td>N = 41</td>
</tr>
</tbody>
</table>
Expectancy Ratings

As shown in Table 4.4, subjects' initial expectancy ratings on a 1-10 scale showed no significant difference, between the EM and NM conditions (\(p < .41\)) and even between high expectancy and low expectancy conditions (\(p < .67\)). These subject ratings at the beginning of the session suggest that subjects were generally neutral to slightly positive about the possible session outcome in all of the treatment conditions.

Table 4.4
Mean Subject Ratings by Groups of Initial Expectancy of Session Efficacy

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD = 2.25</td>
<td>SD = 1.48</td>
<td>SD = 1.82</td>
</tr>
<tr>
<td>Eye Movement</td>
<td>5.72</td>
<td>6.29</td>
<td>6.05</td>
</tr>
<tr>
<td>(N = 9)</td>
<td></td>
<td>(N = 12)</td>
<td>(N = 21)</td>
</tr>
<tr>
<td>No Movement</td>
<td>5.30</td>
<td>5.83</td>
<td>5.55</td>
</tr>
<tr>
<td>(SD = 2.21)</td>
<td>(SD = 1.22)</td>
<td>(SD = 1.79)</td>
<td>(N = 19)</td>
</tr>
<tr>
<td>(N = 10)</td>
<td>(N = 9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>5.50</td>
<td>6.10</td>
<td>5.81</td>
</tr>
<tr>
<td>(SD = 2.18)</td>
<td>(SD = 1.37)</td>
<td>(SD = 1.80)</td>
<td>(N = 40)</td>
</tr>
<tr>
<td>(N = 19)</td>
<td>(N = 21)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subjects were asked at the end of the session how strongly they felt the researcher believed in the procedure. Subjects' estimation ratings on a 1-10 scale (Table 4.5) at the end of the treatment session of the researcher's expectation of the procedure's efficacy showed no significant differences for the various groups (EM vs. NM  p< .79, high vs. low expectancy p< .64). There were no main effects or interactions in the different conditions with these ratings. The subjects' estimates reflect a general rating that the researcher was somewhat positive about the procedure in each of the treatment conditions.

Table 4.5

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Movement</td>
<td>6.87</td>
<td>7.29</td>
<td>7.07</td>
</tr>
<tr>
<td>SD = 2.75</td>
<td>SD = 1.78</td>
<td>SD = 2.27</td>
<td></td>
</tr>
<tr>
<td>N = 8</td>
<td>N = 7</td>
<td>N = 15</td>
<td></td>
</tr>
<tr>
<td>No Movement</td>
<td>7.06</td>
<td>6.90</td>
<td>7.00</td>
</tr>
<tr>
<td>SD = 2.32</td>
<td>SD = 1.14</td>
<td>SD = 1.89</td>
<td></td>
</tr>
<tr>
<td>N = 8</td>
<td>N = 5</td>
<td>N = 13</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>6.97</td>
<td>7.13</td>
<td>7.04</td>
</tr>
<tr>
<td>SD = 2.46</td>
<td>SD = 1.49</td>
<td>SD = 2.07</td>
<td></td>
</tr>
<tr>
<td>N = 16</td>
<td>N = 12</td>
<td>N = 28</td>
<td></td>
</tr>
</tbody>
</table>
Test Anxiety Inventory (TAI) Scores

As shown in Table 4.6, TAI score changes reflect the difference between the pre-session TAI and the TAI approximately one month later. TAI score changes showed no significance for EM versus NM (p< .88) or High vs. Low Expectancy conditions (p< .80). There were no significant main effects or interactions between the various conditions and TAI scores or TAI subscores of emotion and worry. We should, however, note that all groups show substantial reduction in TAI scores, suggesting a lessening of test anxiety.

Table 4.6
Mean Change in Test Anxiety Inventory Scores by Groups

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Movement</td>
<td>-6.60</td>
<td>-6.50</td>
<td>-6.55</td>
</tr>
<tr>
<td></td>
<td>SD = 6.42</td>
<td>SD = 8.75</td>
<td>SD = 7.60</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 12</td>
<td>N = 22</td>
</tr>
<tr>
<td>No Movement</td>
<td>-7.10</td>
<td>-8.22</td>
<td>-7.63</td>
</tr>
<tr>
<td></td>
<td>SD = 11.45</td>
<td>SD = 7.73</td>
<td>SD = 9.61</td>
</tr>
<tr>
<td></td>
<td>N = 10</td>
<td>N = 9</td>
<td>N = 19</td>
</tr>
<tr>
<td>Overall</td>
<td>-6.85</td>
<td>-7.24</td>
<td>-7.05</td>
</tr>
<tr>
<td></td>
<td>SD = 9.03</td>
<td>SD = 8.17</td>
<td>SD = 8.50</td>
</tr>
<tr>
<td></td>
<td>N = 20</td>
<td>N = 21</td>
<td>N = 41</td>
</tr>
</tbody>
</table>

39
Subject Ratings on the Validity of Cognition Scale (VOC)

Shapiro (1992a) developed the Validity of Cognition Scale (range 1-7) as a variant of the SUDs scale to measure change in subject's ratings of their belief in the PSS (Positive Self Statement) developed in EMDR sessions. Shapiro has reported that eye movement increases subjects' comfort and belief in the positive statement as measured by subjects' report of increased VOC ratings. As shown in the following Table 4.7, this study showed no significant main effects or interactions with the four different groups on the VOC ratings. The mean increase was slightly higher in the EM condition than the NM condition (p <.11).

Table 4.7
Mean VOC Score Change on Positive Self Statement

<table>
<thead>
<tr>
<th></th>
<th>Low Expectancy</th>
<th>High Expectancy</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Movement</td>
<td>1.28 (SD = 0.71)</td>
<td>0.91 (SD = 0.70)</td>
<td>1.08 (SD = 0.71)</td>
</tr>
<tr>
<td></td>
<td>N = 9</td>
<td>N = 11</td>
<td>N = 20</td>
</tr>
<tr>
<td>No Movement</td>
<td>0.21 (SD = 1.58)</td>
<td>0.38 (SD = 1.30)</td>
<td>0.30 (SD = 1.39)</td>
</tr>
<tr>
<td></td>
<td>N = 7</td>
<td>N = 8</td>
<td>N = 15</td>
</tr>
<tr>
<td>Overall</td>
<td>0.81 (SD = 1.25)</td>
<td>0.68 (SD = 1.00)</td>
<td>0.74 (SD = 1.11)</td>
</tr>
<tr>
<td></td>
<td>N = 16</td>
<td>N = 19</td>
<td>N = 35</td>
</tr>
</tbody>
</table>
Dependent Measures Pre and Post Treatment

The change in VOC ratings (Table 4.7) is derived from the difference between pre-treatment ratings and post-treatment ratings. These pre- and post-scores are shown in Table 4.8. The pre- and post-treatment scores for the TAI and the SUDS are also shown in this table.

Table 4.8
Mean Scores for all Dependent Measures
Pre- and Post Treatment

<table>
<thead>
<tr>
<th></th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EM</td>
<td>NM</td>
</tr>
<tr>
<td>SUDS</td>
<td>6.72 (1.61)</td>
<td>5.89 (1.80)</td>
</tr>
<tr>
<td>VOC</td>
<td>3.83 (1.04)</td>
<td>3.91 (0.78)</td>
</tr>
<tr>
<td>TAI</td>
<td>58.82 (10.17)</td>
<td>54.16 (9.12)</td>
</tr>
</tbody>
</table>
It should also be noted that approximately half the subjects were treated in the middle of the semester and the other half were treated toward the end of the semester. Because test anxiety levels may change during the semester, the results were examined for differences between those two groups to check for consistency of treatment.

Treatment results showed similar amounts of change. The only statistically significant difference was that subjects levels of anxiety were higher later in the semester, perhaps reflecting imminent final exams.
CHAPTER V
DISCUSSION, SUMMARY AND CONCLUSIONS

The purpose of this study was to evaluate the effect of expectancy and the specific importance of the eye movement in the possible efficacy of EMDR. The results of this study indicate that there was a significant main effect in self report of anxiety reduction (SUDs) between the eye movement and no movement conditions.

The post-treatment ratings on the Test Anxiety Inventory show no significant main effects or interactions between eye movement and no movement conditions, or between high expectancy and low expectancy conditions. However, we should note all groups showed a similar substantial reduction in TAI scores. There were no significant main effects or interactions between high expectancy and low expectancy conditions on the self-report ratings (SUDs) of anxiety reduction.

As shown in Chapter IV, the only statistically significant difference found in this research was that the reduction in SUDs level was greater in the EM condition than in the NM condition. Besides this one statistically significant quantitative difference supportive of Shapiro's procedure, many interesting qualitative observations can be made about the procedures.

**Expectancy**

As Table 4.3 in Chapter IV indicates, it can be seen that the high versus low expectancy conditions had little effect on results. The two conditions had only a very minor impact even on subjects' initial expectations of the efficacy of the treatment. Interestingly, the high
versus low condition had its most salient effect on no-shows for the initial treatment. Of those presented the low-expectancy condition, nine failed to show up for the initial session, whereas only three presented with the high-expectancy condition failed to show up for their initial session. In the post-treatment follow-up, there were three no-shows from the low expectancy condition and three no-shows from the high expectancy condition. These numbers accorded with the idea that the expectancy condition only had impact at the very beginning. For test-anxious college students who often feel bombarded by information, a two-sentence expectancy condition may not be long remembered.

Subjects' ratings of the investigator's expectations at the end of the first session may be to some extent a reflection of the subject's own expectations by the end of the session. As one can see from Table 4.5, EM, NM, high expectancy and low expectancy groups all rate the experimenter's expectation at around 7. A seven on this ten point scale would seem to be a "reasonable" answer reflecting that this was something worthwhile to be doing but unclear how worthwhile. A seven could reflect a subject's being politely positive as well as mystified although several subjects said, "I thought it was useless just like you thought." Other answers were often to the effect of, "If you are doing it, you must believe in it".

As discussed in Chapter II, EMDR may have a negative expectancy. Expectancy may also have played an additional role in this research in terms of how people normally expect to solve their problems. For example, subjects often said that they could not think about the traumatic image while doing the eye movement. They often seemed to view their
inability to think about the past trauma as interfering with their ability to
cognitively process the problem. They may have expected that
cognitively processing the problem is the route to success. The eye
movement may thus have been seen by some as a negative. Besides
leaving one feeling vulnerable, it may have seemed to interfere with the
usual way of cognitively processing a problem. EMDR may make one
less able to think about the issue, thus causing a lack of sense that it can
or will work. One subject described it as "unusual because I couldn't
concentrate on the bad. I wanted to think and not follow the fingers".
Some of the eye movement participants in this study later described the
experience as "odd", "weird" or "distracting".

Few in the no-movement group took up the offer to try eye
movement at the end of their post-treatment session. Some comments
from them included, "It would distract me", "It would rub me the wrong
way", "The idea of moving my eyes would make me nervous", and "I
couldn't think if I did it". Further, there seemed to be a cognitive
dissonance effect when the NM subjects saw the "true" treatment as not
being what they had already received. After having done the treatment
with no movement, subjects had difficulty accepting that the no
movement treatment was not the full treatment.

In Shapiro's procedure, "encouragers" are often offered to the
client when doing eye movement (e.g. "good", "go with that", etc.). This
was not used in either of the treatments to avoid expectancy effects.
Further, "encouragers" would not have been relevant to the NM
condition, where relatively little change is happening with the
memories. It would be difficult to say "good" or "go with that" when a
student was staring at the researcher's fingers. Unfortunately, without the encouragers it might have been difficult for students to know if they were "doing it right". This may have left some subjects feeling unsure and uncertain of what they were doing during the complex procedures of both EM and NM.

Similarity to Hypnosis

After experiencing sets of eye movements, some participants felt that the eye movement was hypnotic. This sense that EMDR was hypnosis created its own powerful expectancy effects for some subjects. Although the subjects had had little formal contact with hypnosis, a number of them mentioned the similarity of EMDR to hypnosis. One student however, said that hypnosis had not worked for her in the past and "was a crock" and that EM was similar to it, i.e. something that would not work for her. One subject said, "I thought I was being hypnotized". Another mentioned guarding herself against hypnosis during the session.

Only one subject dropped out of the study. After hearing the initial description of the EMDR procedure, she was fearful and said it sounded like hypnosis. (She was also fearful reading in the release form statement that there was possible discomfort in session.)

It should be noted that both the eye movement and no movement (staring) could be described as possibly creating hypnotic effects.
Staring by the No Movement Subjects

In studying the eye movement, it is unclear as to what an appropriate alternative no movement condition should look like. Shapiro (personal communication, 1992), suggested that an appropriate no movement condition would be to have subjects close their eyes rather than stare to avoid effects that might presumably be hypnotic. A recent Harvard study under Dr. Roger Pitman (Butler, 1993) has the no-movement subjects stare straight ahead while the therapist's fingers move. However, other studies (Sanderson and Carpenter, 1992; Boudewyns, et al., 1993) have used the staring at unmoving fingers for a NM condition, as did this study.

Only two of the NM subjects commented specifically on the staring aspect of the treatment. One female subject said she had previously used staring for relaxation, but she did not look relaxed during the treatment. Another NM female subject said, "The staring is helpful, like karate." Her comment may correspond to a popular idea of dealing with anxiety by facing your problems directly and staring them down.

Eye Movement versus No Movement

Various Psychotherapeutic Components of EMDR

As mentioned in Chapter II, EMDR is made up of aspects of various psychotherapies. Some students responded to some of these aspects more than others. When asked what was positive for students about the procedures, responses were in four different areas. Three of these areas were common to both procedures. These included talking about and clarifying the anxiety, desensitizing the anxiety, and using
cognitive techniques to lessen anxiety. The fourth aspect was about the eye movement itself.

A number of students said just talking about the anxiety and clarifying the problem was very helpful. At least ten of the NM subjects and at least two of the EM subjects mentioned this. Comments included that "it was good to open up", "it was a relief to get in touch with bad feelings", "it was useful to think back on things", and "talking slowed me down."

A few students responded to the traditional desensitization aspect of the procedure. One student said, "It was helpful sitting with the feeling and dealing with it there." Another said, "It was helpful to face past stuff." However, it should be noted that at least several subjects said they did not like re-experiencing past difficult memories.

Many students, mostly from the NM condition, responded to the cognitive aspects of the procedure, liking the procedure's focus on thinking about what helps. Several students liked having their situation normalized, i.e., that others also have test anxiety and that it is possible to control it. One student said that it forced her to think how she reacted and prepared herself on tests; it helped to pinpoint the causes of test anxiety. Some thought it was positive to observe their reactions to tests. Several felt that adding the positive self statement gave them confidence by turning the negative into a positive. Several subjects reported "realizing how ridiculous it is" and telling themselves "it's no big deal". One subject reported the procedure was like a stress inoculation.

There may be an expectancy from the popular linguistic context about therapy. Even for those subjects who have had little previous
counseling, talk of therapy is widespread in the popular culture. Phrases such as "it's helpful to face the past" or "useful to get in touch with feelings" might be responses that college students might fall back on, particularly when feeling confused or intimidated by the setting. Although the eye movement was mentioned by many EM subjects as positive, perhaps the eye movement did not get mentioned more often due to the "common sense problem" (Waters, 1993) referred to in Chapter II.

Relaxation versus Anxiety

In response to the researcher's query about relaxation, more subjects using EMDR reported feeling a sense of relaxation than those subjects in the no movement group. One student reported being so relaxed for several days afterwards that it drew comment from a roommate. Another reported being more relaxed for several weeks afterwards, such that a family member noticed it. Some subjects noticeably relaxed during the eye movement (shoulders relaxing, etc.) and most reported EM relaxing. One subject who had a very positive response to eye movement described it as "like smoking sage" (seeming to indicate a relaxed state for him, and also sounding like what Shapiro (1992a), half jokingly described as a "Demerol" effect of the eye movement).

Several of the EM subjects spontaneously asked about the possibility of doing it on their own. The response was given that there had been reports (Shapiro, 1992a) of people doing such things as following windshield wipers and that it might be beneficial. (The
researcher gave warnings not to do it while driving.) When a subject later tried it with windshield wipers, he said, "It doesn't work well unless there's rain." One subject tried it on his own with good results by watching the wandering ball screen saver pattern on his computer to relax himself. Another tried using eye movements accompanying her own fingers just before an exam and found it relaxing.

Not all subjects, however, liked EM. One said it was "annoying, and dizzying" although relaxing. Another noted that he felt fatigue and eye strain even though it was relaxing. Another said she felt like she had fallen asleep. One wanted narrower passes because it was tiring moving his eyes so far from the left to the right. One felt a strain like an eye-crossing effect.

In response to questions about anxiety increasing during the session or at any time afterwards, more no movement subjects said they felt anxious. One NM male reported that he was anxious for several days afterwards. Four NM subjects reported episodes of high anxiety around tests in the weeks following.

Behavioral Changes

Subjects reported few behavioral changes at the one month followup. Several EM subjects felt they had acquired significant time management skills, but did not attribute that to the procedure. Only one subject (EM) reported significant physical changes. This was the oldest subject, a female, age forty-six who reported a major drop in sensations of heart palpitations around exams.
Cognitive Shifts

EM did seem to create cognitive shifts for some. For instance, a female eye movement subject said that she could "visualize actually looking forward to tests". A male EM subject, who had been in therapy previously, said, "This gets to solutions much quicker; it's more focused". A female student said, "This gives a positive feeling. I can't focus on the negative". A female NM subject who later tried EM said "EM evolves differently than NM. You go through the memories in a positive way rather than in a negative way." Another female NM subject, later trying EM, said, "The movement helps me walk through the memory—not like focusing which was more difficult". A female EM subject said that the eye movement helped give her access to more images and thoughts with which to examine her test anxiety. These descriptions are similar to those reported by Shapiro (1992a) and Marquis (1991).

Butler (1993) notes that EMDR seems to have a dramatic effect with some and no effect with others. This also appeared to happen in this study, so a retrospective analysis was done of the greatest responders to the treatment. The 9 EM subjects with largest reduction in SUDs (mean -3.16, sd .75) were compared (p < .22) to the 8 NM subjects with largest reduction in SUDs (mean -2.37, sd 1.68). These subjects represented approximately the top third of each group. These EM subjects showed a larger drop in the TAI (mean -8.44, sd 7.09) than the corresponding NM subjects (mean -6.50, sd 7.57). Unlike the overall EM group, this EM group did better than its NM counterparts on the amount of improvement in the TAI score (p < .59). However, there were no
statistically significant differences between the groups on any dependent measures.

**Gender Differences in Results**

Only eleven of the subjects were male. No statistically significant main effects or interactions were found by gender in response to the two eye movement or the two expectancy conditions. No significant qualitative differences were noted also. No previous studies have noted gender differences and notable successes have been reported for both females (Shapiro, 1989a, Wolpe, 1991) and males (Shapiro, 1989b, Boudewyns, 1993).

**Research Limitations**

As presented by the subjects in this study, test anxiety was a somewhat vague anxiety. Test anxiety seemed to have had different sources and aspects for different subjects. Examples seen in this sample included: 1) adjustment shock to being in a new academic system for underclass students, 2) social standing concerns, e.g., "What if others do better at school?" 3) anger at past academic injustices, 4) frustration with self or perfectionism, 5) fear of disappointing parents or even ending up like parents, 6) life transition issues, e.g., concerns about being able to cope as an adult after college, e.g. "Is my future wrecked?", 7) being prone to somatic or physiological responses to any slightly anxious situation and 8) obsessiveness interfering with tests, particularly multiple choice tests.
The subjects often had trouble with the vagueness of the worst memory of test anxiety that were treatment targets (as opposed to the very compelling and specific target images of PTSD used by most EMDR studies). As noted by Boore (1993) and Gannon (1992), very specific clear-cut memories of trauma seem to get a larger drop in SUDs ratings. As seen in Table 4.1, SUDs ratings of a worst test anxiety memory were rated at approximately only a 6 for remembering it now, (although rated as an 8 at the time of the incident) and were only reduced to a little less than 5. Perhaps test anxiety needs more in vivo treatment. Perhaps working the EMDR procedure just before a test might show more dramatic results.

The vagueness of targets and anxiety was also aggravated by the vagueness of procedure. Giving SUDs ratings and particularly VOC ratings were often frustrating and difficult for college students. For instance, when the EMDR procedure is used with children, there are no VOC ratings for the PSS. The subjects in this study often showed little insight, often did not want to engage deeply, were inarticulate and often not psychologically minded. Older students were less intimidated by the research setting and quicker to identify positive results. Perhaps age or developmental awareness is more of a factor than gender in experimental results, particularly with self ratings such as SUDs and VOC that require awareness of fine gradations of change in oneself.

Vulnerability

A feeling of vulnerability often seems to accompany the EMDR procedure. Having an unknown therapist's fingers a foot away from one's eyes may seem like a boundary violation. The phrase "in your
"face" seems apt in describing the procedure. Shapiro appropriately emphasizes that providing a sense of safety and rapport are of paramount importance in facilitating the EMDR procedure.

The no movement procedure (EMDR minus the eye movement) can be seen as an exposure technique. Boudewyns, et al. (1993) call the no-movement procedure, "exposure control". Exposure to past memories of anxiety, in early stages, may raise anxiety. The no movement group in this study did have numerous subjects with increased anxiety as reflected in the SUDs results. Although NM subjects averaged little change in SUDs, actually almost as many NM subjects showed increase in anxiety as showed decrease. One of the no movement subjects reported a large burst of anxiety around tests a week later, but reported some slight overall improvement during the month after the initial no movement treatment.

It should be noted that EM can also raise anxiety, although in a different way than exposure. Images from the distant past of a subject can suddenly and unexpectedly arise with great force and with need for further treatments to resolve them. A Cambodian subject who had lost his family in Cambodia in the tragic war was randomly assigned to the NM condition. If he had been assigned to the EM condition, the possible reopening of a seemingly unrelated trauma would have had to be considered.

No overall adverse effects were reported by EM subjects. Only two EM students showed increase in anxiety as reflected in SUDs. If, as occasionally happens with EMDR treatments (Shapiro, 1992a), the client feels a need to prematurely terminate the session for any reason, a
variety of guided relaxation exercises are presented by the therapist. This was never necessary during this study. Subjects were invited to call the researcher afterward if they felt the need to talk about the session or about their perception of their anxiety but this was also not used. Several subjects did not want to follow up on images or memories that came up during the procedure and these were not pursued. Three subjects from the no movement group and three subjects from the eye movement group reported emotional discomfort going into the memory during the session but all subjects felt comfortable enough to continue with the session. Six subjects mentioned preferring more preparation and information before the session.

Subjects often seemed intimidated by the research setting, the one on one depth therapy aspect of it, i.e., telling a stranger about intense past difficulties and being open to unexpected new material arising. At least six subjects reported a dislike of exploring past memories.

The answers to the question, "Would you recommend this to friends?" were not particularly helpful. Respondents were unfailingly polite and few said they would not recommend it. Most said they would recommend the procedure which had been presented to them. If they were unenthusiastic, they said "maybe" or "if the friends wanted it". Verbal and non-verbal cues suggested that slightly more EM than NM students were enthusiastic about recommendation.

**Procedural Difficulties**

A response needs to be made to Shapiro's (1993) complaints of recent equivocal results in studies such as Sanderson's (1992) where the
EM procedure is finished without first showing a nearly complete drop in SUDS. The drop in SUDS for EM subjects in this research was also not nearly as dramatic as in the Shapiro studies. This may be due to several factors.

Test anxiety was treated as a "process phobia." (EMDR Level Two Training describes treatment for what are called "process phobias," basically adding a "video" future rehearsal desensitization.) Therefore, in one session, multiple images were worked on, i.e., past, present, and future imaging of test anxiety. There was not a total focus on one memory. This may have caused less reduction in SUDS.

Perhaps insufficient time was spent working on desensitizing the worst memory. This was due to the need to keep the times equal in the EM and NM condition, and also due to treating test anxiety as a process phobia, (for which time has to be spent on imagery of the future). SUDs ratings, however, were only compared on the worst memory.

It was difficult to keep the eye movement condition and the no movement condition for the same amount of time. No movement subjects were more inclined to stop sooner. It might be suggested that not enough NM was done to cause "extinction" of anxiety around a particular memory. However, as the NM condition is like an exposure technique, exposure does raise anxiety as reflected in SUDs results. Further, subjects may not have been prepared to continue an in-depth exposure technique because of the discomfort that would arise. In addition, subjects in the NM condition reported fewer changes on which to work. This may be due to the NM condition causing fewer changing images.
Summary and Conclusions

The purpose of this study was to compare reduction in test anxiety using a full and a partial EMDR protocol on subjects. This comparison focused on the responses of subjects with differing expectancy suggestions and with differing eye movement conditions. No significant main effects or interactions were found in any of the expectancy conditions. No significant differences were found in the Test Anxiety Inventory results with all groups. However, there was a significant difference in the SUDs ratings between the EM and NM conditions. The EM procedure was significantly more efficacious in decreasing anxiety related to a particular memory as measured by the SUDs scale.

Both the eye movement and no movement, as well as the high and low expectancy groups appeared to have had a substantial reduction in test anxiety, as measured by the TAI. Spielberger (personal communication, 1993) noted that the amount of this study's reported reduction is similar to the reduction derived from five-session cognitive treatments he is currently giving to college student subjects. However, there was no significant difference in the amount of reduction between the groups. This may be due to the fact that some of the powerful elements in EMDR, such as talk therapy, normalization, classical desensitization and cognitive restructuring, were common to both groups.

This study's results are not nearly as dramatically positive as Shapiro's (1989a) and Marquis' (1991) studies in the significance of EMDR usefulness. Like Sanderson (1992), this researcher had previously gotten
very dramatic results clinically which, in a follow-up controlled study, did not appear as dramatically positive. However, this study showed EMDR as more promising than is presented by detractors such as Hammond (1991). The significant difference between EM and NM in the amount of SUDs decrease is supportive of Shapiro's contention that the eye movement is a key variable in the efficacy of EMDR.

The eye movement does appear to have had a significant relaxing effect, even with a possible negative expectancy. Students' subjective ratings showed strong responses to eye movement. The eye movement seems to be an often powerful but unpredictable intervention, certainly worthy of further study.

Anecdotal reports from this study were mostly very positive (although no results were as dramatic as that obtained with the math anxious grammar school student discussed in Chapter I). However, once again studies still have not shown EMDR causing significant change on pencil and paper psychological measures.

What role expectancy plays is still uncertain. We may conclude from this study that whatever expectancy effect exists is due to more than a two sentence pre-treatment explanation. This study may not have generated sufficiently different expectancy conditions to study expectancy effects.

This study supports the contention of Lohr, et al (1992) that the use of the VOC scale in the "reprocessing" part of the procedure is of questionable value. Although many subjects liked the concept of putting in a positive cognition in the place of the previous negative cognition, subjects had more difficulty using the VOC subjective measure than the
SUDs and many had great difficulty finding a particularly relevant positive cognition. Future research might followup on this problem by studying an EMDR group versus an EMD group, checking the validity of Shapiro's contention that "reprocessing" is also vital to EMDR.

This study seemed to highlight previous suggestions that EMDR works most dramatically with very specific intense anxiety. In a relatively diffuse condition, such as test anxiety, desensitizing a single past memory may not generalize sufficiently to resolve the anxiety syndrome.

A more multifaceted anxiety, such as test anxiety, may take longer or need more than one session. It also may take more ingenuity on the therapist's part in finding and installing specific positive cognitions.

Although some studies have used two sessions (Boudewyns, 1993) and some have used numerous sessions (Gannon, 1992; Wolpe, 1991), EMDR has been claimed to be efficacious after only one session (Shapiro, 1989; Lipke, 1992; Puk, 1991). The EMDR Professional Issues Committee (1991) wrote of the procedure as using both one and "maybe more" sessions. Dr. Sandra Foster, Research Director of EMDR, (personal communication, 1993) suggested that perhaps more than one session might be necessary. Stronger results might have been obtained using EMDR in conjunction with other techniques (e.g. study techniques). This may need to be considered in future research on EMDR and test anxiety.

This study was of a relatively small sample. With its low power, it may not be possible to generalize to the full test anxiety population. Further empirical study with larger populations is recommended.
APPENDIX

CONSENT FOR VOLUNTARY PARTICIPATION
Consent for Voluntary Participation

Project Title: Treatment of Test Anxiety

Researcher: Philip Gosselin, M.Ed., Counseling Psychology Doctoral Candidate

This is a study of a new therapy method tailored for the treatment of test anxiety. Participation in this study involves the following.

1) Attendance at one ninety-minute session of individual treatment with the investigator.

2) Completion of brief documentation prior to the session and one month following the treatment session.

The potential benefit of this treatment is reduction in test anxiety. No major difficulties have been reported using this treatment. However, the treatment may briefly evoke strong feelings or memories.

Participation in this program is strictly voluntary and members are free to withdraw at any time. Due to the number of volunteers for this study, some students may not be able to participate in this program. A referral for other types of treatment for test anxiety will be made if desired.

Results from this study will be included in the researcher’s doctoral dissertation and may also be included in manuscripts submitted to professional journals for publication. However, subjects’ names and any potentially identifying material will be strictly confidential. The results will be reported as general group statistics. If reference is made to specific cases, pseudonyms will be used.

I fully understand the above and volunteer to participate.

Signature ___________________ Date_______

Name (print) ________________ Tel. No._________

Best time subject can be reached at this number.
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