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Single Session Treatment of Test Anxiety with Eye Movement Desensitization and Reprocessing (EMDR)

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One session of Eye Movement Desensitization and Reprocessing (EMDR) appeared to be an effective treatment for test anxiety, reducing reported physiological distress, worry, and fears of negative evaluation. The research design included two components: a comparison study, comparing Immediate Treatment and Wait List groups, and a replication study, comparing the treatment response of Immediate and Delayed (Treated Wait List) groups. Seventeen test anxious university students were randomly assigned to one session of EMDR or Wait List. At post-test, the Immediate group demonstrated significant improvement, compared to the Wait List group, on the Test Anxiety Inventory (TAI) and Fear of Negative Evaluation Scale. Treatment effects were maintained at follow-up. The Wait List group received treatment after post-measures were taken. Treatment of the Delayed group replicated effects. Improvement was reflected by large treatment effect sizes and a decrease in percentile ranking on the TAI from the 90th to the 50th percentile.

KEY WORDS: test anxiety; Eye Movement Desensitization and Reprocessing (EMDR); students; treatment outcome.

Eye Movement Desensitization and Reprocessing (EMDR) is a therapeutic treatment used to desensitize the distressing emotions related to past disturbing and traumatic events. It is reported to aid in the restructuring of related negative cognitions, while simultaneously relieving accompanying physiological arousal. EMDR has been tested primarily in the treatment of post-traumatic stress disor-

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der (PTSD) and has been found effective in six of seven controlled trials with civilian populations (Lee & Gavriel, 1998; Marcus, Marquis, & Sakai, 1997; Rothbaum, 1997; Scheck, Schaeffer, & Gillette, 1998; Vaughan, Wiese, Gold, & Tarrier, 1994; Wilson, Becker, & Tinker, 1995; 1997).

EMDR appears to be successful in stopping the intrusive thoughts of PTSD, reducing physiological distress, relieving overwhelming anxiety, and changing negative self-defeating cognitions. Other anxiety disorders also share some of these kinds of symptoms (Barlow, 1988) and there are indications that EMDR may be successful in the treatment of fear and phobias (De Jongh & Ten Broeke, 1998; De Jongh, Ten Broeke, & Renssen, 1999) but the research is inconclusive. The present study sought to investigate the effectiveness of EMDR in the treatment of test anxiety.

There have been two studies that examined the use of EMDR with test anxiety. Because these studies were both dismantling component studies, only limited conclusions about efficacy can be made. Gosselin and Matthews (1995) investigated the effects of expectancy (high vs. low) and eye movements (movement vs. fixed gaze) in the reduction of test anxiety with 41 students in a 2×2, four condition design. Scores on the Test Anxiety Inventory (TAI) showed significant reduction of test anxiety with improvement for all groups. There was no effect found for expectancy or for eye movements. Bauman and Melnyk (1994) compared eye movements with metronome-timed finger tapping for 15 pairs of students. There was a significant decrease in scores on the Emotionality subscale of the TAI for both groups. Unfortunately, poor treatment fidelity limited the conclusions. The absence of controls for nonspecific effects makes it impossible to rule out placebo-like nonspecific effects. These studies indicate that EMDR may be effective in the treatment of test anxiety, but findings are inconclusive.

Test anxiety is characterized by apprehensive ruminations and self-denigrating thoughts of potential catastrophe, and is accompanied by physiological arousal and significant emotional distress (Sarason, 1980). The individual with test anxiety reacts rapidly with an established set of arousal-driven negative thoughts. These negative and self-derogatory cognitions may distract the person's attention, prevent successful task accomplishment, and result in significant performance deficits. The dread of being unable to perform may become a self-fulfilling prophecy. Test anxiety not only impairs performance during an examination, but may also contribute to avoidant behavior, with test-anxious students avoiding studying and preparation. Apprehension, hopelessness, and expectations of failure can dominate both test preparation and examination processes. Negative self-referential thoughts of inadequacy and incompetence dominate the conscious mind, with frequent reminders and intrusive thoughts about poor performance and the disastrous consequences of failure (Leary &

Kowalski, 1995). The accompanying high levels of physiological arousal are interpreted as dangerous and threatening (Wine, 1980).

Test anxiety is understood to have two specific components: worry and emotionality (Sarason & Sarason, 1990). Worry cognitions are fairly constant over time; they are elicited by evaluative stressors and remain elevated for several days prior to the examination and throughout the exam. Sapp (1993) suggests that worry "is a stable personality disposition that interferes with cognitive performance and triggers autonomic reactivity and maintains test anxiety" (p. 191). It appears that worry may be a more important factor than emotionality. Worry is consistently negatively correlated with performance while emotionality is not. Emotionality can be understood as including the physiological experience of increased arousal, the individual's awareness of arousal, and the negative or fearful assessment made about arousal. Emotionality is highest at the beginning of the exam, and tends to decrease over the course of the test.

Test anxiety can be a form of social phobia and appears to be related to concerns with social evaluation. It has been found to correlate with scores on the Fear of Negative Evaluation Scale (Goldberg, cited in Sarason & Sarason, 1990).

The present study was designed to assess the effectiveness of EMDR in the treatment of test anxiety. It was hypothesized that EMDR should be effective in alleviating test-related physiological distress and in decreasing negative self-preoccupied cognitions, resulting in significant decreases on scores of the TAI (with its three scales: Total, Emotionality, and Worry). EMDR is reportedly effective in changing frequently repeated patterns of negative self-attributions to more positive, realistic self-concepts; therefore, a decrease in scores on the Fear of Negative Evaluation Scale was anticipated. Although EMDR treatment of a particular memory network is said to generalize to other memories within that same network (Shapiro, 1995), it was not clear whether one treatment session would be sufficient to effect global change. The State Trait Anxiety Inventory (STAI) was employed to explore this possibility.

METHOD

Participants

Forty-four second-year psychology students participated in the screening process. Students were asked to exclude themselves from participation if they met any of the following criteria: vision problems, epilepsy, pregnancy, neurological impairment, psychosis, dissociative disorders, or major depression. Four

students did not complete the pre-treatment tests. Other exclusion criteria were scores lower than 50 on the TAI (Spielberger, 1980), which is 0.5 *SD* above the mean for college students, and scores higher than 30 on the Dissociative Experiences Scale (DES) (Bernstein & Putnam, 1986) indicating a possible dissociative disorder. Eighteen students were excluded for low scores (average 38.7) on the TAI, and 5 students for high scores on the DES (average 38.9). Seventeen students (2 male and 15 female) participated in the experiment and were randomly assigned to either Immediate (n = 8) or Delayed Treatment (n = 9) groups. One woman in each group did not complete the Time 2 tests. Fifteen subjects completed the experimental process.

Design

The study had two components: (1) a Wait List Comparison study, comparing Immediate Treatment to a Wait List control, and (2) a Replication study, comparing the treatment response of the Immediate group with that of the Delayed (treated Wait List) group.

Measures were administered on three occasions, Time 1 (week 0), Time 2 (week 4), and Time 3 (week 10). The Immediate group received treatment between Time 1 and Time 2; the Delayed group received treatment between Time 2 and Time 3. Time 3 measures were completed during final exams. For the Immediate group, Time 2 measures were post-treatment measures, and Time 3 measures were follow-up measures. For the Delayed group, Time 2 scores were used as post-measures for the Wait List Comparison study, and as pre-treatment scores for the Replication study. The Delayed group Time 3 scores were post-treatment measures for the Replication study.

Investigator

The principal investigator was also the therapist. She is an experienced counselor and at the time of the study had 5 years of experience in the use of EMDR. She was trained by F. Shapiro in both Levels I and II in 1993.

Measures

Treatment outcome measures included the TAI, the STAI, and the Brief Fear of Negative Evaluation Scale (FNE). These were administered at Time 1, Time 2, and Time 3. Process measures were taken at the beginning and end of

the treatment session: the Subjective Units of Distress Scale (SUDS) and the Validity of Cognition Scale (VOC).

Test Anxiety Inventory (TAI)

The TAI (Spielberger, 1980) is a 20-item questionnaire that yields a total score and two subscale scores, Emotionality and Worry. The items assess reactions before, during, and after exams. The inventory asks subjects to rate their agreement on a four-point scale (1 = totally untrue, 4 = totally true) with statements such as "During tests I feel very tense." Validity coefficients are about .82, with a reliability of .80. The TAI correlates negatively with grades, with correlations ranging from $-.18$ to $-.31$. The mean score on the TAI for female college students is 42 and for male students 39. A score of 50, which is 0.5 standard deviation above the mean, was set as an exclusion criterion for this study. Students scoring above 50 are at the 75th percentile or higher.

Brief Fear of Negative Evaluation Scale (FNE)

The Brief FNE (Leary, 1983) is a short form of the original FNE (Watson & Friend, 1969) with which it correlates very highly (.96). The FNE measures apprehension about and avoidance of negative evaluation by others. The psychometric properties are adequate; the normalization sample was college students (Scholing & Emmelkamp, 1990). The mean was 35.7, with a standard deviation of 8.10. There is a test-retest reliability of .78 and a moderately high correlation with other instruments.

State-Trait Anxiety Inventory (STAI)

The STAI (Spielberger, 1983) measures trait anxiety and state anxiety. There are 40 items, half measure trait anxiety and half measure state anxiety. There is substantial evidence to confirm the psychometric properties of the STAI. Test-retest reliabilities for the trait anxiety range from .73 to .86. State anxiety varies from time to time and from situation to situation, and the state scale shows an expected low reliability from .16 to.54. Concurrent validity studies show that the STAI trait scale correlates well with other measures of trait anxiety. Internal consistency ranges between .83 and .92. Factor analysis studies support the two-dimensional structure, confirming that state and trait are two different dimensions (Kaplan & Saccuzzo, 1997). Normal controls usually score around 38 on each scale.

Subjective Units of Distress Scale (SUD)

The SUD Scale (Shapiro, 1989; Wolpe, 1991) is a single-item measure of subjective distress, using a Likert scale from 0 (none) to 10 (the most distressed possible). The SUD scale provides a baseline to assess progress during the session. Beginning and final scores were recorded.

Validity of Cognition (VOC)

The VOC (Shapiro, 1989) is a single-item measure of the validity of a positive cognition. First the client was asked to identify the negative cognition that was associated with the traumatic event, and then to construct a preferred positive cognition. The client then rated how "true" that positive cognition seemed to them. This is the Validity of Cognition rating. It measures the degree of acceptance on a Likert scale of 1 (completely untrue) to 7 (completely true). Beginning and final scores were recorded.

Assessor

Outcome measures were distributed and collected by an individual who was independent and blind to treatment condition.

EMDR Treatment Procedure

EMDR was individually administered in a single 90-minute session. Each session included six phases: (1) preparation, (2) assessment, (3) desensitization, (4) installation of the positive cognition, (5) body scan, and (6) closure. Preparation included a description of the EMDR process and a discussion of the problems related to test anxiety. Assessment involved the choice of the incident to be targeted, the identification of related image, cognitions, affect, and body sensations, and the taking of SUD and VOC scores. Shapiro's phobia protocol (1995, p. 222) includes targeting (1) the first time the fear was experienced, (2) the most disturbing experiences, (3) the most recent experience, (4) associated present stimuli, (5) physical sensations, (6) a positive template for future fear-free action, and (7) "video tape" imagery. Clients identified the first, worst, most recent, and future anticipated experiences of test anxiety. Processing began with the incident that elicited the most current anxiety and then was redirected to earlier related incidents. During the desensitization phase, the subject focused on the material while simultaneously moving the eyes back and forth,

following the therapist's fingers. The average set of eye movements was 30 traverses, lasting about 30 seconds each. The procedure continued for approximately 60 minutes and included a segment that targeted fears related to future exams. The installation phase started when the SUDS score was low (0–2); the therapist then installed the positive cognition with additional eye movements. Before closure, the therapist had the subject scan their body by closing their eyes and noticing if there was any emotional distress or tension in the body. If so, more desensitization was done to eliminate this.

RESULTS

Pre-Treatment

There were no pre-treatment differences between groups on any measures. The mean of pre-treatment scores on the TAI total scale was 58.5, placing the students at the 90th percentile for college students. On the FNE, the students fell within normal range at pre-treatment.

Study One: Immediate/Wait List Comparison

Test Anxiety Inventory

The Immediate treatment group showed significantly greater improvement for test anxiety symptoms between Time 1 and Time 2, compared to the Wait List group (see Figure 1 and Table 1). There were significant group $\times$ time interactions on the Total scale of the TAI [F (1,13) = 11.09, $p < .05$], the Emotionality subscale [F(1,13) = 9.18, $p < .05$], and the Worry subscale [F (1,13) = 9.4, $p < .05$]. There were large effect sizes (Cohen's d) for the Immediate group on all the TAI scales (see Table 2) and minimal effect sizes for the Wait List controls. Percentile rankings, using the Professional Manual (Spielberger, 1980) were only calculated for the female students because there was just 1 male in each group. There was a decrease in percentile rank for the female Immediate participants from the 91st percentile at Time 1, to 70th at Time 2, to 52nd percentile at Time 3. The percentile rankings for the Wait List female students did not change between Time 1 and Time 2.

Fear of Negative Evaluation

There was a marginally significant group $\times$ time interaction, indicating that the Immediate treatment group showed greater improvement between Time

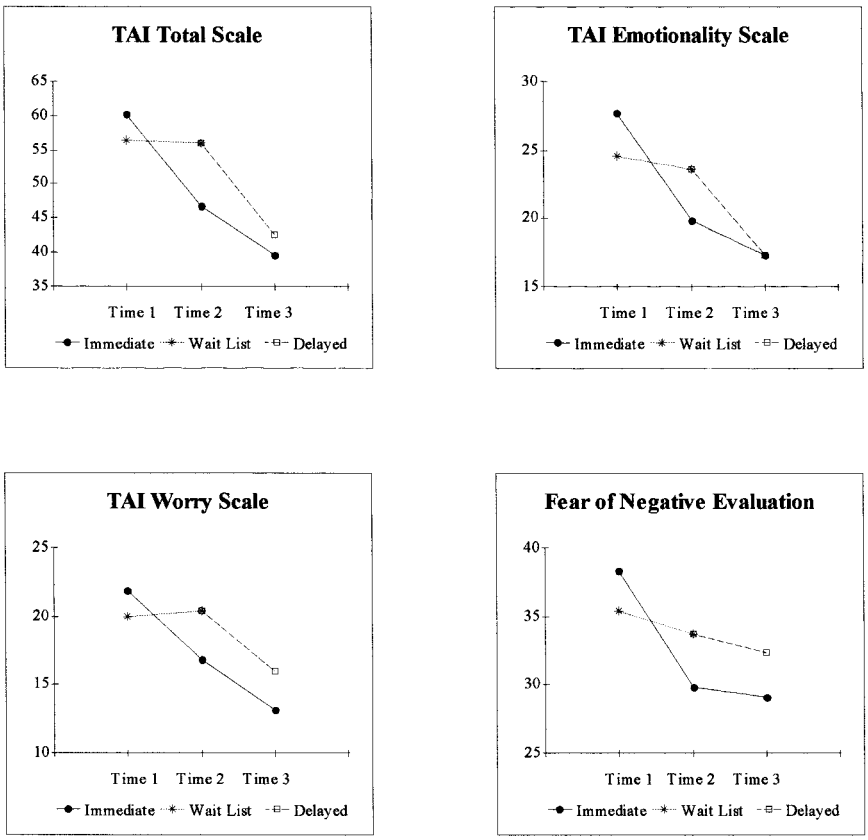

Fig. 1. Comparison of Immediate, Wait List, and Delayed (Treated Wait List) groups.

1 and Time 2 for symptoms related to fears of negative evaluation compared to the Wait List group [F (1,12) = 4.63, p = .05]. There was a medium effect size.

State Trait Anxiety Inventory

Mixed measure ANOVAs determined that there were no differences between groups on the STAI measures for any of the three measurement times. There was a main effect for time on the Trait scale, showing a significant decrease in anxiety symptoms between Time 1 and Time 2 for both groups [F (1,12) = 8.28, $p < .05$].

Table 1. Comparison of Immediate, Wait List, and Delayed (Treated Wait List) Groups: Means (M) and Standard Deviations (SD) of Measures at Pre- and Post-Treatment and at Two Month Follow-Up, with Percentile Ranks (PR: for Female Subjects)

	Immediate			Wait List/Delayed		
Variable	M	SD	PR	M	SD	PR
Test Anxiety Inventory (TAI)						
Total Scale						
Pre-	60.14	8.88	91	56.50	3.96	84
Post-	46.71	15.16	70	56.00	10.14	81
Follow-up	39.71	12.88	52	42.50	12.76	57
Emotionality Subscale						
Pre-	27.71	3.73	93	24.50	2.39	82
Pos-	19.86	6.31	64	23.62	4.34	77
Follow-up	17.29	4.89	51	17.33	4.46	47
Worry Subscale						
Pre-	21.86	6.31	90	20.00	4.34	85
Pos-	16.86	6.72	76	20.38	5.40	85
Follow-up	13.14	5.58	50	16.00	16.69	66
Brief Fear of Negative Evaluation (FNE)						
Pre-	38.33	18.00		35.38	8.07	
Post-	30.50	12.94		33.75	7.61	
Follow-up	30.83	15.33		32.33	10.58	
State Trait Anxiety Inventory (STAI)						
State Subscale						
Pre-	41.17	21.37	68	44.13	14.11	71
Post-	42.17	14.47	73	42.88	16.03	71
Follow-up	37.20	14.48	45	33.50	10.19	42
Trait Subscale						
Pre-	48.67	12.56	87	47.75	15.09	72
Post-	39.67	7.28	59	44.13	11.38	69
Follow-up	37.17	13.14	40	41.50	13.84	62

Follow-Up

Maintenance for treatment effects for the Immediate group at 2 months was tested by comparing post-treatment scores at Time 2 with follow-up scores at Time 3 using paired sample t-tests for the Immediate group. There was a significant decrease on the Worry subscale of the TAI [t (6) = 2.74, $p < .05$] indicating that these subjects were experiencing less symptoms related to that scale at Time 3. None of the other measures showed any significant change (see Table 1). This indicates that treatment effects were maintained at two-month follow-up for the Immediate participants. The effect sizes for change between pre-treatment and follow-up were larger than those at post-treatment for the TAI scales, but there was no change on the FNE (see Table 2).

Table 2. Effect Sizes[a] for Immediate, Wait List, and Delayed Groups

	Immediate Group		Wait List/Delayed Group	
	Pre-Treatment to Post-Treatment	Pre-Treatment to Follow-Up	Time 1 to Time 2	Pre-Treatment to Post-Treatment
TAI Total	1.08	1.85	0.06	1.17
TAI Emotionality	1.51	2.40	0.25	1.43
TAI Worry	0.66	1.23	−0.08	0.35
FNE	0.50	0.49	0.15	0.20

[a]Effect Size is Cohen's *d*: the mean difference, divided by the pooled standard deviation.

Study Two: Replication of Treatment with the Wait List Group

The Wait List group received treatment between Time 2 and Time 3. This replication of treatment allowed for further assessment of EMDR. For the Delayed (treated Wait List) group, Time 2 measures were used as pre-treatment scores and Time 3 measures as post-treatment scores. These treatment effects were compared to the pre- and post-measures of the Immediate group. There were no group by treatment interactions, indicating that EMDR treatment had equivalent effects for the Immediate and Delayed groups (see Table 1 and Figure 1). The pre- and post-treatment effect sizes of the Delayed group were similar to those of the Immediate group (see Table 2).

There was a main effect for time indicating a significant decrease in test anxiety for both groups on the TAI total scale [F (1, 11) = 32.56, $p < .05$]. Significant main effects were also found on the TAI Worry subscale [F(1, 11) = 17.46, $p < .05$], the TAI Emotionality subscale [F(1,11) = 28.34, $p < .05$], the FNE [F(1, 10) = 9.91, $p < .05$] and on the Trait subscale of the STAI [F(1, 10) = 10.93, $p < .05$]. These findings show a significant decrease in symptoms for both groups after EMDR treatment, with no differences between the Immediate and Delayed groups.

Treatment Process

Emotional Distress

SUDS ratings were taken at the beginning and end of each treatment session during administration of treatment to all subjects (see Figure 2). SUDS scores were analyzed using a 2 (beginning vs. end of session) × 2 (Immediate vs. Delayed group) ANOVA. There was no significant group × session interaction, indicating that there was no difference between treatment groups. How-

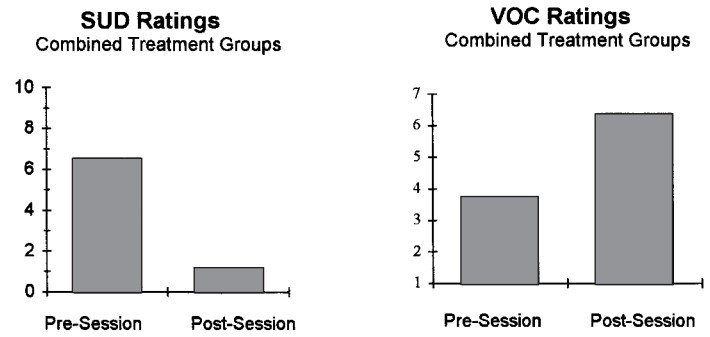

Fig. 2. In-session measures: SUD and VOC ratings for combined groups.

ever, there was a significant main effect for session with a significant decrease in SUDS scores [$F(1,13) = 222.21$, $p < .05$) reflecting a decrease in reported distress at session's end for both groups. There was large effect size of 3.63. Combined group means were 6.53 at session start (SD = 1.66) and 1.13 at session end (SD = 1.29).

Cognitions

VOC ratings were taken at the beginning and end of each treatment sessions. The VOC scores were analyzed by using a 2 (beginning vs. end of session) × 2 (Immediate vs. Delayed treatment) ANOVA. There was no group × session interaction but there was a significant main effect for session indicating a significant increase in VOC scores [F (1,13) = 48.11, $p < .05$] reflecting an increase in the subjects' belief in the truth of their positive cognitions. There was a large effect size of 2.40. Combined group means were 3.73 at a session start (SD = 1.31) and 6.37 at session end (SD = .83). The negative cognitions fell into three broad categories: 9 subjects expressed negative beliefs about coping/competency ("I can't do it"); 4 subjects expressed negative beliefs related to success/failure ("I'm a failure"), and 2 expressed self-denigration ("I'm stupid"). The positive cognitions that were installed included statements such as "I am competent," "I'm okay, even if others think badly of me."

Correlations Between Measures

A correlation analysis was performed on the Time 1 tests to determine the relationship between the various measures. As expected, the TAI subscales correlated highly with the Total scale with correlations of .61 for Emotionality and

.77 for Worry. The Worry and Emotionality subscales appeared to be measuring different aspects of test anxiety because they had a low and nonsignificant correlation ($r = .23$) with each other. The Emotionality scale did not correlate with any other scale. There was a high and significant correlation between the STAI-trait and STAI-state ($r = .70$). The STAI-state scale did not correlate with any other measures. The STAI-trait scale had significant correlations with the TAI-total scale ($r = .64$) and the TAI-worry scale ($r = .83$). The FNE scale had significant correlations with the TAI-worry scale ($r = .62$) and with the STAI-trait scale ($r = .67$).

DISCUSSION

At post-treatment, the Immediate treatment group was found to have significantly improved on all scales of the TAI and marginally on the FNE compared to the Wait List group. EMDR appeared to be successful in eliminating the distress that the students were experiencing before, during, and after their examinations. The scores of the Wait List group on the TAI and FNE scales showed minimal change, indicating that there was no regression to the mean and that the test anxiety of subjects in this sample did not spontaneously improve. It appears that the significant improvement of the Immediate group was a result of the treatment.

There was a significant reduction of reported high arousal symptoms, the physiological sensations of tension and nervousness which are often interpreted by the individual as dangerous and threatening, and which may elicit greater levels of arousal. There was also a significant decrease in worry, the self-reported cognitive symptoms of fear, preoccupation with threat, confusion, and lack of confidence. Fears of being evaluated, the expectations of being judged as inadequate, and accompanying negative and self-derogatory cognitions that accompany evaluation anxiety were also reduced.

The only significant change for the Immediate group at follow-up was a decrease in the Worry scores. Because there was no control group at follow-up, it is impossible to conclude that this decrease is the sole result of treatment. However, this lowered score could be explained as the result of the post-treatment subjects having a number of successful experiences writing examinations, further decreasing their belief in the potential of failure, and thus decreasing worry.

State anxiety remained constant throughout the study and across conditions. This seems to suggest that the treatment effects were specific to test anxiety and that they did not generalize to the other stresses experienced by these students. This also provides another control for regression to the mean. It is unclear from the findings of this study how the EMDR treatment affected

trait anxiety. There was a decrease in scores for both groups at each measurement time. The small sample size is very sensitive to individual differences. No conclusion can be made concerning trait anxiety in this experiment.

The treatment effects were maintained at two-month follow-up. Because the Time 3 measures were taken during the final exams, the treatment was well tested. Subjects' responses showed that they were no longer experiencing severe test anxiety, and that they were now functioning at the 50th percentile on the TAI. This maintenance of treatment effects indicates that the single session EMDR treatment was successful in eliminating test anxiety.

When treatment was provided to the Delayed group their response paralleled that of the Immediate group for test anxiety. This replication of treatment effects with the Delayed group allows for the elimination of such threats to validity as time of treatment, history, subject factors, and repeated testing. The Immediate group received treatment mid-semester while the Delayed group received treatment at the end of the semester, just prior to final exams, and their post-tests were done during the final exams. This replication increases the generalizability of the study, indicating that the results of the Immediate group were not specific to that particular group at that particular time.

This was a one session study and was therefore limited in its treatment scope. It was only possible to target one incident. Although the treatment was successful, it would probably be advantageous to offer students several sessions. Other treatment programs for test anxiety such as cognitive behavioral therapy, relaxation therapy, study skills counseling, and supportive counseling, all require a minimum of four sessions (Sapp, 1993).

EMDR appears to achieve effects similar to those of other treatment types. The pretreatment vs. follow-up effect size for the Immediate group in this study was 1.85. This compares favorably with the results of seven sessions of cognitive therapy ($d = 1.90$) and rational emotive therapy ($d = 1.67$) (Fletcher, cited in Spielberger, 1980). The fact that EMDR achieved similar effects in one session indicates that it may be of greater efficiency.

STRENGTHS AND LIMITATIONS

This study was quite sound methodologically, meeting five (and a sixth partially) of the seven "gold standards" (Foa & Meadows, 1997). These were (1) target symptoms were clearly defined, with clear inclusion and exclusion criteria; (2) standardized measures were used; (3) an independent individual, who was blind to treatment condition, distributed and collected the assessment measures; (4) the assessor was trained in the use and scoring of standardized measures; (5) the program was manualized and replicable; (6) group assignment was randomized (although there was only one therapist). One standard was not

met: (7) no treatment adherence ratings were done. The lack of treatment integrity ratings means that degree of treatment fidelity is unknown.

A critical limitation of this study is the use of a Wait List control; this makes it impossible to rule out the nonspecific effects of treatment, and the findings are potentially attributable to placebo effects. However the large effect sizes suggest this to be unlikely. The use of the Wait List control does not allow comparison of EMDR with other treatment methods. A better test would have been a direct comparison with such treatments as cognitive behavioral therapy, study skill training, or relaxation training. However, because the primary outcome measure was a standardized measure, it was possible to compare the change in scores on the standardized norm. These effects of treatment were large and appear to be equivalent to those achieved by other therapies using more treatment sessions.

Because the researcher and the therapist were the same individual, there is the possibility of experimenter bias. Attempts were made to minimize this by using standardized measures. Demand characteristics were minimized by having the measures distributed and collected by a disinterested objective person rather than by the researcher. A small sample size limited the power of statistical tests. However, because the effect size statistics were generally in the large range, the small sample size was less of a concern. The small sample size may affect the representativeness of the sample, and thus limit generalizability. Minority groups were not represented. Comorbidity and study skills were not assessed, so it is not known to what extent these may have affected the results.

Although this was a controlled design with random assignment, treatment was provided to the control group between Time 2 and Time 3 to meet ethical obligations. This loss of the control group meant that there was no control for the Time 3 follow-up measures for the Immediate group. However, the replication of treatment effects with the Delayed group allowed for the exclusion of some threats to internal validity, including time of treatment, history, subject factors, and repeated testing.

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