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Eye Movement Desensitization and Reprocessing Treatment for Panic Disorder: A Controlled Outcome and Partial Dismantling Study

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Forty-three outpatients with *DSM–III–R* (*Diagnostic and Statistical Manual of Mental Disorders*, 3rd Ed., revised; American Psychiatric Association, 1987) panic disorder were randomly assigned to receive 6 sessions of eye movement desensitization and reprocessing (EMDR), the same treatment but omitting the eye movement, or to a waiting list. Posttest comparisons showed EMDR to be more effective in alleviating panic and panic-related symptoms than the waiting-list procedure. Compared with the same treatment without the eye movement, EMDR led to greater improvement on 2 of 5 primary outcome measures at posttest. However, EMDR's advantages had dissipated 3 months after treatment, thereby failing to firmly support the usefulness of the eye movement component in EMDR treatment for panic disorder.

Although eye movement desensitization and reprocessing (EMDR) was originally developed as a treatment for traumatic memories (Shapiro, 1989, 1991), it has since been rapidly adopted for a wide variety of problems, particularly anxiety disorders other than posttraumatic stress disorder (PTSD; see Shapiro, 1995). In several randomized clinical trials, researchers tested EMDR's effects for PTSD-related symptoms. EMDR proved to be more beneficial than a no-treatment control (Olasov-Rothbaum, in press; Wilson, Tinker, & Becker, 1995; but see Jensen, 1994) and a placebo treatment (Scheck, Schaeffer, & Gillette, in press). Comparisons with legitimate alternative treatments for PTSD yielded largely equivocal results (Boudewyns & Hyer, in press; Boudewyns, Stwertka, Hyer, Albrecht, & Sperr, 1993; Vaughan et al., 1994). However, interventions were too brief to adequately deliver alternative treatments, not allowing us to determine with confidence whether EMDR was equivalent in efficacy to the comparison treatments. Whether EMDR is as or more beneficial than existing validated treatments for PTSD (e.g., prolonged exposure, stress inoculation training; see Foa, Olasov-Rothbaum, Riggs, & Murdock, 1991) thus remains to be seen.

Furthermore, EMDR is being used for a variety of disorders other than PTSD (cf. Shapiro, 1995) when evidence for its efficacy is lacking. One purpose of the present study, therefore, was to examine whether EMDR is helpful in the treatment of a disorder other than PTSD: panic disorder. Like traumatic events that cause PTSD, panic attacks are frequently perceived as sudden, unpredictable, and life threatening (McNally & Lukach, 1992), and the subsequent symptoms of panic disorder are similar, in some ways, to those associated with PTSD. Panic disorder may thus be well-suited for treatment by EMDR. These considerations led us to conduct an uncontrolled case series on EMDR treatment of panic disorder (Goldstein & Feske, 1994). We found that six sessions of EMDR led to significant improvement across a broad range of symptoms. Pre–post effect sizes were large, ranging from 0.86 to 1.69 for panic frequency, fear of fear, and generalized anxiety. Given our positive pilot data and given that EMDR is being promoted as a treatment for panic disorder (Shapiro, 1995) in the absence of solid empirical support, a controlled study on EMDR's efficacy seemed important. Accordingly, we conducted an initial test of EMDR's effects for panic disorder by contrasting EMDR to a waiting-list (WL) procedure in a randomized controlled trial.

Mechanisms underlying EMDR's purported efficacy remain a contested issue (e.g., Dyck, 1993). Though EMDR differs from imaginal exposure therapies such as covert rehearsal, flooding, and systematic desensitization with respect to how exposure is carried out, it seems that exposure to fear-evoking stimuli is a core component of EMDR. Evidence for the potency of exposure in the treatment of anxiety is supported by a large body of empirical data (Barlow, 1988). Apart from the type of exposure, EMDR differs from traditional exposure treatments in the use of eye movement, EMDR's most controversial component. Indeed, EMDR has generally proved no more effective than control procedures without the eye movement (Boudewyns & Hyer, in press; Boudewyns et al., 1993; Pitman et al., 1996; Renfrey & Spates, 1994; Sanderson & Carpenter, 1992). However, these negative findings are difficult to interpret be-

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cause power for the comparison of very similar treatments was low, and treatments may have been too brief to permit the detection of differential effects. The second purpose of the present study, therefore, was to examine the importance of the eye movement in a randomized controlled trial, with a larger treatment dose than prior studies, by contrasting the effects of EMDR to those of the same treatment but omitting the eye movement (eye fixation exposure and reprocessing [EFER]).

Method

Experimental Design

The efficacy of EMDR was contrasted with that of a WL in a 2 (group) × 2 (pretest, posttest) mixed-model factorial design with repeated measures on the second factor. The role of the eye movement was tested by contrasting EMDR's efficacy with that of the EFER procedure at posttest and 3-month follow-up in a 2 (group) × 3 (pretest, posttest, follow-up) design with repeated measures on the second factor. Thus, omnibus three-group comparisons were eschewed in favor of focused comparisons. On the basis of our pilot data, we hypothesized that EMDR would be more effective than WL. In light of the inconclusive findings regarding the benefits of the eye movement, we made no predictions about differences between EMDR and EFER.

Participants were initially randomly assigned to one of the three groups. WL participants were randomly reassigned to one of the two active treatments after the delay period if they still met inclusion criteria. Therapists were crossed with treatment condition, and clients were randomly assigned to therapists within scheduling constraints.

Participants

Inclusionary and exclusionary criteria. Participants were 43 outpatients with a *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM-III–R*; American Psychiatric Association, 1987) diagnosis of primary panic disorder, complicated by agoraphobia in all but two cases. Participants were diagnosed with the Structured Clinical Interview for *DSM* (SCID; Spitzer, Williams, Gibbon, & First, 1990). The SCID was administered by doctoral and master's level psychologists and by research assistants, all of whom had been trained according to the instructions provided by the SCID manual. All SCIDs were audiotaped, and randomly selected interviews were scored by a second rater unaware of the first rater's diagnoses. Interrater reliability was calculated on a sample of 63 interviews; 16 (25%) of the SCIDs conducted for the present study were included in that sample. Kappa for current panic disorder with agoraphobia was .89; the percentage of agreement for current panic disorder without agoraphobia (for which the sample was too small for calculation of kappa) was 96.8%.

Participants were included if they recorded at least one panic attack during the 2-week pretest monitoring period and if they had panic disorder for at least 1 year. Participants who were in concurrent psychotherapy were included if they agreed to suspend therapy for the duration of the study. Included in the follow-up assessment were only those clients who reported not having received any additional psychological or pharmacological treatment during the follow-up period.

Exclusionary criteria were a SCID-I diagnosis of current or past psychosis, organic mental disorder, current alcohol or substance dependence, or obsessive-compulsive disorder; and a SCID-II diagnosis of paranoid, schizoid, schizotypal, borderline, or antisocial personality disorder. Participants with current major depression were excluded if the depression was of greater severity than the panic disorder or if the depression was accompanied by suicidal ideation. Because there is some evidence that high doses of benzodiazepines interfere with behavioral treatment (Marks, et al., 1993), participants with a daily dosage of more than 1.5 mg alprazolam or equivalent dosages of other benzodiazepines were excluded. Participants who were taking psychotropic medication were required to be on a stable dosage.

Of 230 applicants who met criteria for panic disorder based on a brief telephone screening, 20.9% reported no panic attacks during the 2-week period prior to the screening, 10% were not able to travel to the center because of agoraphobia, 9.1% did not meet medication entry criteria, 6.5% reported that the panic symptoms had begun less than 1 year prior to the interview, 6.5% were prevented from participation because of time constraints, 5.2% were not willing to suspend current psychotherapy for the duration of the present study, and 11.3% were no longer interested after the program had been described to them. Seventeen applicants were excluded following the SCID interview because they did not meet diagnostic criteria. One applicant was excluded because she did not record any panic attacks during the pretest monitoring period.

Attrition. Of 43 participants who entered the study, 5 (11.6%) dropped out (1 from each treatment group and 3 prior to random assignment). One client resumed regular therapy before EMDR treatment was completed because she thought that the treatment was not helpful. One EFER client had to be referred for alternative treatment because she became very depressed after the second session. Both client and therapist believed this depressive episode to be unrelated to treatment. Two participants, 1 assigned to EMDR and the other to EFER, were no longer interested in the treatment after completion of the WL. Following the diagnostic interview, 1 participant dropped out for unknown reasons. Of 36 clients who provided posttreatment data, 8 were not included in the follow-up sample. Seven of these clients elected to continue in treatment immediately after completion of the EMDR or EFER treatment phase, and 1 EFER client was no longer interested in participation for unknown reasons.

Sample characteristics. Forty participants completed at least one phase of the study, 4 of whom only completed the WL. Clients' mean age was 35.2 years (range = 20–54). Thirty-one participants were female; 34 were Caucasian and 6 African American. Of the participants, 25 had attended at least some college, 21 were employed, and 2 were students. Mean duration of the panic disorder was 10.2 years (range = 1–28). Four clients were taking psychotropic medications. Fifteen participants had comorbid diagnoses (range = 1–3): simple phobia (7), generalized anxiety disorder (6), major depression (3), social phobia (2), dysthymia (1), and anxious cluster personality disorders (5).

Measures

Outcome measures. Panic symptoms were assessed with reliable and valid questionnaire measures. The Agoraphobic Cognitions Questionnaire and Body Sensations Questionnaire (ACQ and BSQ; Chambless, Caputo, Bright, & Gallagher, 1984) were used to assess thoughts concerning catastrophic consequences of anxiety and fear of physical sensations. The Mobility Inventory for Agoraphobia (MI; Chambless, Caputo, Jasin, Gracely, & Williams, 1985) was included to assess avoidance of situations both while accompanied and alone. Clinical anxiety was measured with the Beck Anxiety Inventory (BAI; Beck & Steer, 1990). The Panic Appraisal Inventory (PAI; Telch, 1987) was used to assess (a) the likelihood of panic attacks in agoraphobic situations, (b) negative physical, social, and loss of control consequences of panic attacks, and (c) confidence in coping with future attacks. This instrument has received relatively little psychometric investigation, but initial evidence (Feske & de Beurs, 1997) suggests its properties are sound. Secondary symptoms were assessed with the Beck Depression Inventory (BDI; Beck & Steer, 1987), Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982), and Social Adjustment Scale, Self-Report (SAS-SR; Weissman & Bothwell, 1976). Participants completed questionnaires 1 week before treatment, 1 week after treatment, and 3 months after treatment.

Self-monitoring records were used to assess panic frequency, fear of panic, and generalized anxiety. For each panic episode, participants recorded the date, duration, maximum level of anxiety, and symptoms accompanying the attack using the list of symptoms defining panic attacks according to *DSM-III–R* criteria. Each night clients recorded the following information on 11-point scales: the maximum fear of having a panic attack for the day and the highest and average level of generalized anxiety during the day.

Participants maintained self-monitoring records for an average of 7 weeks (2 weeks pretreatment, the 3 weeks of treatment, 2 weeks posttreatment). In addition, they monitored anxiety symptoms for 2 weeks at follow-up. WL participants continued self-monitoring for an average of 7 weeks and completed questionnaires 1 and 6 weeks after the SCID. The latter served as both post-WL and pretreatment assessment.

Control measures. Following description of the treatment and its rationale, clients rated treatment credibility and expectation for improvement (cf. Borkovec & Nau, 1972). After the second treatment session, clients completed the Therapist Rating Scale (Williams & Chambless, 1990), on which they rated their therapist on six dimensions (e.g., positive regard). All participants recorded basic demographic information.

Treatment

Treatments were conducted according to manuals developed for this study and refined during the pilot study (Goldstein & Feske, 1994). Constants were one information-gathering session followed by five EMDR or EFER sessions (one 2-hour and four 90-min sessions) conducted over an average of 3 weeks. During the initial session, the therapist identified relevant anxiety-provoking memories, such as the first and worst panic attack, life events that the client identified as related to the panic disorder, and anticipated panic episodes. To enhance purity, therapists were enjoined from using interventions representing treatment modalities other than EMDR (e.g., anxiety management training, cognitive therapy, in vivo exposure to agoraphobic situations). Clients were not given homework assignments for exposure. Very brief exposure to bodily sensations was allowed only if clients failed to experience anxiety during treatment and was thus merely used to elicit anxiety necessary to be able to apply EMDR or EFER.

EFER was administered identically to EMDR except that clients watched the therapist's index and middle fingers held stationary, the finger tips level with the client's eyes and at a comfortable distance for the client, approximately 12 inches away from his or her face.

Therapists. Therapy was delivered by Ulrike Feske, a master's level psychologist who had been treating panic disorder for 1 year, and Alan Goldstein, a doctoral level psychologist with 25 years experience in treating panic disorder. Both were trained in EMDR by Francine Shapiro (Level I and Level II Training, 1991) and both had used EMDR for the treatment of panic for at least 40 sessions.

Treatment integrity. To verify that the treatment manual and integrity checklist accorded with Shapiro's definition of EMDR, she rated the quality of these documents using a 7-point scale (0 = *unacceptable quality*, 6 = *high quality*). Shapiro (personal communication, October 1994) assigned both documents a rating of 5, midway between acceptable and high quality. Supervisory meetings between the therapists were held regularly to discuss clinical issues and the integrity of treatment delivery.

Two research assistants, both with Level I training in EMDR, conducted the assessment of adherence. Both prescribed and proscribed interventions were detailed on the integrity checklist. All sessions were audiotaped, and 32 were randomly selected for coding by the principal rater. Of these, 12 were independently rated by the second assistant for reliability. Average percentage of agreement for the 35 integrity items was 95.5%. Decisions to exclude a client's data because of fidelity violations were to be made by the two integrity raters. No significant violations were detected.

Additional manipulation checks. Comparisons of EMDR and EFER clients' scores on the Therapist Rating Scale yielded nonsignificant results, indicating that clients in the two treatment groups held very similar attitudes toward their therapists. Nor did EMDR and EFER clients' ratings for treatment credibility and expectation for improvement differ. Indeed, clients found both treatments to be highly credible (M = 7.8 on a 0–10 scale). To allow exposure sets to be timed exactly, therapists initiated each set with explicit verbal cues such as "go with that" and terminated each set with cues such as "blank it out." A research assistant reviewed 32 randomly selected treatment sessions and timed the length of imaginal and interoceptive exposure using a stopwatch. Her ratings showed that EMDR and EFER clients received an equivalent amount of exposure. Interoceptive exposure was applied in three of the EMDR and three of the EFER sessions the rater reviewed and was carried out for an average of 3.6 min per EMDR and 4.0 min per EFER session, confirming that therapists kept the application of interoceptive exposure to a minimum and that they did so consistently across treatment modalities. Tests for the potentially confounding influence of therapists effects yielded nonsignificant results. Finally, we recruited an experienced EMDR clinician to conduct a review of treatment quality of randomly selected treatment sessions. Unfortunately, these data proved to be of little use because the clinician did not consistently follow the treatment manual in his ratings.

Results

In data analyses, EMDR was compared with each of the other two groups. Tests for differences between two groups in control and outcome variables at pretest were conducted with t tests, Mann-Whitney tests, chi-square tests, or Fisher's exact tests. Tests for differential treatment effects were performed with analyses of covariance (ANCOVAs) on the posttest or follow-up scores of each of the outcome measures, with pretest scores on the respective measures as the covariate. To reduce Type I error while avoiding overly stringent alpha levels which diminish power, we reduced the number of primary panic measures by computing composite scores. Exploratory analyses were conducted on secondary measures of depression, general distress, and social adjustment. If necessary, analyses were performed with logarithmically transformed scores to achieve normality and homogeneity of variances.

Preliminary Analyses

For the purpose of comparing the EMDR and WL groups, participants who completed the WL before receiving EMDR were excluded from the EMDR group. The two groups did not differ on any of the potential control variables (i.e., age, gender, ethnicity, marital status, education, employment, duration of the panic disorder, current use of psychotropic medication, number of participants with comorbid *DSM-III–R* disorders), $ps \geq .36$. No differences in control variables emerged between EMDR and EFER clients, $ps \geq .15$.

Treatment Outcome

Composite scales. Panic frequency is an important variable in its own right and was therefore not included in the composite scales. We calculated separate composite scales for questionnaire and self-monitoring measures. Scores of the participants

included in the present study were analyzed using principal components factor analyses with varimax rotation. Exploratory factor analyses on questionnaire measures yielded a three-factor solution, explaining 73% of the variance at pretest and 78.4% of the variance at posttest. On the basis of these results, we constructed three composite scales: (a) Social Concerns–General Anxiety (ACQ-Social Concerns, PAI-Social Concerns, PAI-Loss of Control Concerns, BAI), (b) Agoraphobia–Anticipated Panic–Coping (MI-Avoidance Alone and Accompanied, PAI-Anticipated Panic, PAI-Coping), and (c) Physical Concerns (ACQ-Physical Concerns, PAI-Physical Concerns, BSQ). Factor analyses on self-monitoring scores yielded one factor, explaining 78.2% of the variance at pretest and 74.6% of the variance at posttest. Accordingly, we constructed a single composite scale for self-monitoring data, Generalized Anxiety–Fear of Panic (fear of panic, highest and average level of generalized anxiety). Cronbach's alphas for the composite scales ranged from .82 to .88. Factor solutions at pre- and posttest were almost identical, indicating that the solutions were replicable and stable over time.

Attrition. Participants in the EMDR–WL and EMDR–EFER comparison groups were equally likely to provide posttest data, $p = .49$ and $p = 1.00$, respectively. The number of EMDR and EFER clients who did not provide follow-up data was equal ($n = 4$ per group). Comparisons between completers ($n = 38$) and dropouts ($n = 5$) on pretest symptoms yielded nonsignificant results, $ps \geq .38$, suggesting that clients who provided posttreatment data were a representative sample of those who entered the study in terms of symptom severity.

Posttest differences between EMDR and WL. Table 1 shows descriptive statistics for the individual measures included in the composite scales, ANCOVA results for posttest differences between EMDR and WL, and controlled effects sizes for EMDR calculated as Cohen's (1988) d. At pretest, the two groups did not differ on any of the primary measures ($ps \geq .11$) or secondary measures ($ps \geq .47$). However, at posttest, EMDR clients showed greater improvement than WL clients on all measures. All effect sizes were large.

Posttest differences between EMDR and EFER. Table 2 shows pre- and posttest scores and test statistics for between-groups differences. At pretest, the EMDR and EFER groups did not differ on any of the primary measures ($ps \geq .18$) or the SAS-SR ($p = .11$). However, EMDR clients were more impaired on the BSI ($p = .03$), and there was a trend in that direction for the BDI ($p = .10$).

ANCOVAs revealed that EMDR clients improved more than EFER clients on two of five primary measures: log Agoraphobia–Anticipated Panic–Coping and Generalized Anxiety–Fear of Panic. However, EMDR was no more effective than EFER in reducing Social Concerns–General Anxiety, Physical Concerns, or log panic frequency, though nonsignificant differences favored EMDR. Analyses of secondary measures showed that EMDR was superior to EFER on log BDI and on SAS-SR. Also, EMDR clients tended to show greater improvement on the BSI.

To determine whether the lack of significant between-groups differences is due to low power, effect sizes were calculated as Cohen's (1988) f. Following Cohen's procedures, we first calculated f^2 as the effect size for the between-groups differences yielded by ANCOVAs. The effect size f^2 was then transformed into f. Cohen defines f values of 0.10, 0.25, and 0.40 to indicate small, medium, and large effects, respectively. Power analyses indicated that our sample was large enough to detect effects of ≥ 0.49, with $\alpha = .05$ (two-tailed) and power = .80. Pre–post between-groups effect sizes were 0.45, 0.23, and 0.19 for Social Concerns–Generalized Anxiety, log panic frequency, and Physical Concerns, respectively. Thus, nonsignificant differences in Social Concerns–Generalized Anxiety could be attributed to lack of power due to limitations of the sample size.

Because EMDR clients were more impaired on the BSI and BDI at pretest, we conducted further analyses to explore whether these variables predicted outcome at posttest. Stepwise multiple regression analyses were performed on each of the primary measures, with posttest scores as the criterion and pretest scores forced to enter the equation as the first variable to control for pretest differences. The predictors of interest, pretest BDI and BSI, were allowed to enter the equation through forward selection if they contributed to the equation at the .10 level of significance. Analyses indicated that pretest BDI predicted posttest Agoraphobia–Anticipated Panic–Coping scores: More depressed clients improved more on this composite variable (beta $= -.26$; $p = .006$). Accordingly, we conducted a second ANCOVA on posttest Agoraphobia–Anticipated Panic–Coping scores, with pretest composite and BDI scores as covariates. Log BDI was not significant as a covariate ($p = .45$), and the treatment differences remained significant, $F(1, 32) = 7.83$, $p = .009$, indicating that EMDR led to greater improvement on Agoraphobia–Anticipated Panic–Coping even when pretest depression was partialed out. Thus, EMDR clients' greater pretest severity on BDI and GSI does not account for the lack of differential effects between EMDR and EFER on Social Concerns–Generalized Anxiety, Physical Concerns, or log panic frequency. Nor does it explain EMDR's superior effects on Agoraphobia–Anticipated Panic–Coping and Generalized Anxiety–Fear of Panic.

Follow-up differences between EMDR and EFER. To check for differences in treatment response between clients who were ($n = 28$) and those who were not included in the follow-up sample ($n = 8$), we performed ANCOVAs on the posttest scores of each of the outcome measures. Treatment was not included as a factor because of the small number of clients lost to follow-up ($n = 4$ per treatment group). The two groups did not differ in response to treatment, $ps \geq .15$ for primary measures and $ps \geq .29$ for secondary measures.

Table 3 shows pretest, posttest, and 3-month follow-up scores and test statistics for follow-up differences between EMDR and EFER. The two groups did not differ in pretest severity, $ps \geq .19$ for primary measures and $ps \geq .15$ for secondary measures. ANCOVAs on follow-up scores with pretreatment scores covaried failed to show any significant between-groups effects. Thus, EMDR clients' greater improvement on the Agoraphobia–Anticipated Panic–Coping and Generalized Anxiety–Fear of Panic scales at posttest was no longer evident 3 months after treatment. Nor did EMDR maintain its superiority on the BDI, BSI, or SAS-SR.

We found medium pretest follow-up between-groups effect sizes (Cohen's f) of ≤ 0.25 for primary measures, indicating that nonsignificant differences favoring EMDR were consider-

Table 1
Posttest Comparisons Between Eye Movement Desensitization and Reprocessing (EMDR) and Waiting-List (WL) Clients

Measure	EMDR (n = 15)		WL (n = 12)		F	p	Cohen's d
	M	SD	M	SD			
Scores on measures in the Social Concerns–General Anxiety composite							
PAI-Loss of Control Concerns							
Pretest	45.30	25.10	47.40	36.70			
Posttest	27.10	26.40	44.10	36.00			
ACQ-Social Concerns							
Pretest	2.75	0.92	2.94	1.19			
Posttest	2.19	0.86	2.65	1.17			
PAI-Social Concerns							
Pretest	63.30	19.00	53.70	26.30			
Posttest	44.40	32.40	47.70	28.90			
Beck Anxiety Inventory							
Pretest	26.40	11.10	27.20	9.75			
Posttest	13.90	7.94	25.90	8.40	6.04	.022	0.68
Scores on measures in the Agoraphobia–Anticipated Panic–Coping composite							
MI-Avoidance Alone							
Pretest	2.92	1.11	3.09	1.43			
Posttest	2.26	0.83	3.00	1.39			
MI-Avoidance Accompanied							
Pretest	2.10	0.62	2.25	0.90			
Posttest	1.59	0.51	2.19	0.93			
PAI-Anticipated Panic							
Pretest	49.50	22.30	54.7	23.00			
Posttest	36.20	20.40	53.00	23.90			
PAI-Coping							
Pretest	31.90	17.10	23.30	15.80			
Posttest	54.90	21.80	26.90	15.20	34.36	.000	1.10
Scores on measures in the Physical Concerns composite							
ACQ-Physical Concerns							
Pretest	2.16	0.58	2.44	0.95			
Posttest	1.88	0.61	2.31	1.01			
PAI-Physical Concerns							
Pretest	47.10	25.5	49.70	34.40			
Posttest	29.50	26.6	52.80	30.40			
Body Sensations Questionnaire							
Pretest	2.72	0.61	2.92	0.66			
Posttest	2.23	0.81	2.89	0.70	5.91	.023	0.81
Scores on measures in the General Anxiety–Fear of Panic composite							
Highest Anxiety							
Pretest	6.40	1.28	7.35	1.11			
Posttest	5.30	1.31	6.86	1.50			
Average Anxiety							
Pretest	5.87	2.08	6.67	1.30			
Posttest	3.77	2.17	6.43	1.76			
Fear of Panic							
Pretest	4.39	1.22	4.92	0.99			
Posttest	3.45	1.27	4.71	1.31	8.60	.007	1.35
Panic frequency							
Frequency of Panic Attacks[a,b]							
Pretest	3.45	1.86	3.66	1.98			
Posttest	1.02	1.13	3.14	3.20	13.50	.001	0.88
Scores on secondary outcome measures							
Beck Depression Inventory[b]							
Pretest	15.00	7.38	17.90	11.50			
Posttest	6.80	5.86	17.90	11.20	14.40	.001	1.24
Brief Symptom Inventory							
Pretest	1.55	0.57	1.43	0.66			
Posttest	0.79	0.67	1.31	0.74	10.29	.004	0.74
Social Adjustment Scale							
Pretest	2.13	0.22	2.21	0.42			
Posttest	1.75	0.35	2.18	0.53	9.01	.006	0.96

Note. Measures in italicized sections are primary dependent variables. F and p values show the effect of group on posttest scores with pretest scores covaried. Analyses of covariance (ANCOVAs) for composite measures were conducted with composite scores. Effects sizes were calculated with composite scores. PAI = Panic Appraisal Inventory; ACQ = Agoraphobic Cognitions Questionnaire; MI = Mobility Inventory.
[a] Depicted is the total number of panic attacks in raw score form. [b] To satisfy the homogeneity of slopes assumption, we conducted ANCOVAs with logarithmically transformed scores.

Table 2

Posttest Comparisons Between Eye Movement Desensitization and Reprocessing (EMDR) and Eye Fixation Exposure and Reprocessing (EFER) Clients

Measure	EMDR (n = 18)		EFER (n = 18)		F	p
	M	SD	M	SD		
Scores on measures in the Social Concerns–General Anxiety composite						
PAI-Loss of Control Concerns						
Pretest	45.00	25.60	41.50	29.90		
Posttest	28.20	27.50	34.70	28.50		
ACQ-Social Concerns						
Pretest	2.69	0.95	2.76	0.88		
Posttest	2.21	0.88	2.51	1.05		
PAI-Social Concerns						
Pretest	62.60	21.50	48.10	29.50		
Posttest	43.90	33.00	36.80	28.10		
Beck Anxiety Inventory						
Pretest	26.80	11.00	25.70	9.65		
Posttest	14.20	7.66	19.30	10.40	1.79	.19
Scores on measures in the Agoraphobia–Anticipated Panic–Coping composite[a]						
MI-Avoidance Alone						
Pretest	2.90	1.12	3.07	1.18		
Posttest	2.28	0.80	2.86	1.25		
MI-Avoidance Accompanied						
Pretest	2.07	0.60	2.25	0.93		
Posttest	1.55	0.47	2.03	0.82		
PAI-Anticipated Panic						
Pretest	50.90	21.90	47.20	21.80		
Posttest	36.50	19.80	38.00	22.40		
PAI-Coping						
Pretest	31.50	16.70	28.90	19.00		
Posttest	55.30	19.90	38.80	21.5	7.65	.009
Scores on measures in the Physical Concerns composite						
ACQ-Physical Concerns						
Pretest	2.12	0.63	1.90	0.78		
Posttest	1.84	0.58	1.79	0.58		
PAI-Physical Concerns						
Pretest	45.90	26.10	32.60	30.80		
Posttest	29.00	25.20	23.40	22.90		
Body Sensations Questionnaire						
Pretest	2.77	0.62	2.55	0.54		
Posttest	2.22	0.76	2.28	0.64	0.35	.56
Scores on measures in the General Anxiety–Fear of Panic composite						
Highest Anxiety						
Pretest	6.53	1.23	7.03	1.52		
Posttest	5.48	1.27	6.61	1.54		
Average Anxiety						
Pretest	6.04	2.00	5.95	1.92		
Posttest	4.07	2.09	4.92	2.29		
Fear of Panic						
Pretest	4.59	1.22	4.45	1.50		
Posttest	3.64	1.27	4.23	1.68	5.28	.028
Panic frequency						
Frequency of Panic Attacks[a,b]						
Pretest	3.27	1.79	3.81	3.26		
Posttest	0.94	1.09	1.69	2.81	0.44	.510
Scores on secondary outcome measures						
Beck Depression Inventory[a]						
Pretest	17.20	10.90	12.20	6.10		
Posttest	7.28	5.94	9.17	5.55	4.96	.033
Brief Symptom Inventory						
Pretest	1.58	0.67	1.14	0.46		
Posttest	0.77	0.62	0.86	0.46	3.96	.055
Social Adjustment Scale						
Pretest	2.19	0.39	1.97	0.39		
Posttest	1.76	0.36	1.90	0.45	5.96	.020

Note. Measures in italicized sections are primary dependent variables. F and p values show the effect of group on posttest scores with pretest scores covaried. Analyses of covariance (ANCOVAs) for composite measures were conducted with composite scores. PAI = Panic Appraisal Inventory; ACQ = Agoraphobic Cognitions Questionnaire; MI = Mobility Inventory.

[a] To satisfy the homogeneity of regression assumption, we performed ANCOVAs with log-transformed scores. [b] Depicted is the total number of panic attacks over a 2-week period in raw score form. One EFER client was identified as a univariate outlier due to high panic frequency scores (z = .83, $p < .001$), and her panic frequency data were excluded from the analyses.

Table 3
Three-Month Follow-Up Comparisons Between EMDR and EFER Clients

Measure	EMDR (n = 14)		EFER (n = 14)			
	M	*SD*	*M*	*SD*	*F*	*p*
Scores on measures in the Social Concerns–General Anxiety composite						
PAI-Loss of Control Concerns						
Pretest	39.60	22.10	44.40	31.70		
Posttest	25.90	27.80	33.50	31.20		
Follow-up	24.60	29.70	30.90	28.90		
ACQ-Social Concerns						
Pretest	2.55	0.92	2.85	0.98		
Posttest	2.19	0.86	2.56	1.18		
Follow-up	1.97	0.84	2.45	1.14		
PAI-Social Concerns						
Pretest	58.60	21.90	50.10	32.40		
Posttest	42.90	34.10	36.90	30.70		
Follow-up	33.90	30.50	28.90	27.60		
Beck Anxiety Inventory						
Pretest	25.20	11.90	23.90	9.08		
Posttest	13.80	8.15	17.40	10.40		
Follow-up	13.10	11.90	14.20	9.51	0.49	.49
Scores on measures in the Agoraphobia–Anticipated Panic–Coping composite						
MI-Avoidance Alone						
Pretest	2.79	1.15	3.03	1.20		
Posttest	2.23	0.86	2.86	1.28		
Follow-up	2.27	1.14	2.62	1.13		
MI-Avoidance Accompanied						
Pretest	2.07	0.64	2.27	0.92		
Posttest	1.61	0.50	2.04	0.74		
Follow-up	1.75	0.90	1.89	0.65		
PAI-Anticipated Panic						
Pretest	46.60	19.40	46.20	20.80		
Posttest	34.10	19.20	36.70	23.30		
Follow-up	33.20	18.30	37.20	24.20		
PAI-Coping						
Pretest	33.80	17.90	29.50	20.00		
Posttest	57.90	20.60	42.50	22.30		
Follow-up	46.10	24.70	49.60	18.60	0.01	.93
Scores on measures in the Physical Concerns composite						
ACQ-Physical Concerns						
Pretest	2.04	0.61	1.75	0.73		
Posttest	1.82	0.59	1.66	0.48		
Follow-up	1.65	0.54	1.62	0.60		
PAI-Physical Concerns						
Pretest	41.90	27.50	26.20	26.40		
Posttest	27.40	27.80	15.40	12.20		
Follow-up	31.40	25.70	19.70	18.40		
Body Sensations Questionnaire						
Pretest	2.63	0.58	2.49	0.54		
Posttest	2.19	0.84	2.17	0.68		
Follow-up	2.09	0.78	2.05	0.72	0.11	.75
Scores on measures included in the General Anxiety–Fear of Panic composite						
Highest Anxiety						
Pretest	6.56	1.20	6.95	1.66		
Posttest	5.64	1.15	6.52	1.66		
Follow-up	5.60	1.84	5.58	1.68		
Average Anxiety						
Pretest	4.51	1.22	4.32	1.57		
Posttest	3.70	1.32	4.12	1.86		
Follow-up	3.78	1.55	3.51	1.61		
Fear of Panic						
Pretest	5.93	2.03	6.02	2.10		
Posttest	3.87	2.32	4.94	2.48		
Follow-up	3.85	2.67	3.93	2.71	0.10	.75
Panic frequency						
Frequency of Panic Attacks[a]						
Pretest	3.46	1.96	3.97	3.49		
Posttest	1.09	1.13	2.02	3.10		
Follow-up	0.82	1.08	1.59	2.85	0.34	.57

(table continued)

Table 3 (*continued*)

Measure	EMDR (n = 14)		EFER (n = 14)			
	M	*SD*	*M*	*SD*	*F*	*p*
	Scores on secondary outcome measures					
Beck Depression Inventory						
Pretest	15.00	7.66	11.10	6.39		
Posttest	7.07	5.97	8.00	5.52		
Follow-up	8.57	9.03	6.50	5.42	0.01	.91
Brief Symptom Inventory						
Pretest	1.41	0.63	1.11	0.51		
Posttest	0.76	0.71	0.78	0.49		
Follow-up	0.90	0.74	0.65	0.38	0.09	.77
Social Adjustment Scale						
Pretest	2.08	0.28	1.98	0.44		
Posttest	1.78	0.32	1.88	0.51		
Follow-up	1.88	0.26	1.77	0.39	0.26	.61

Note. Measures in italicized sections are primary dependent variables. F and p values show the effect of group on follow-up scores with pretest scores covaried. Analyses of covariances (ANCOVAs) for composite measures were conducted with composite scores. EMDR = eye movement desensitization and reprocessing; EFER = eye fixation exposure and reprocessing; PAI = Panic Appraisal Inventory; ACQ = Agoraphobic Cognitions Questionnaire; MI = Mobility Inventory.

[a] Panic frequency scores of the outlier in the EFER group were excluded, leaving data of 13 subjects for this variable. Depicted is the total number of panic attacks over a 2-week period in raw score form. The ANCOVA was calculated with log-transformed panic frequency scores.

ably smaller at follow-up than at posttreatment. The absence of differential treatment effects between EMDR and EFER at follow-up is therefore due to the drop in effect sizes, not loss of power.

Within-treatment condition t tests revealed that, overall, EMDR and EFER clients maintained their gains across the follow-up period. However, there was a trend for EMDR clients to show deterioration on Agoraphobia–Anticipated Panic–Coping (p = .093), whereas EFER clients continued to improve on Generalized Anxiety–Fear of Panic (p = .030) and tended to do so on the SAS-SR (p = .071). Nonsignificant results of t tests showed a similar pattern for the BDI and BSI. Taken together, these findings suggest that EMDR clients' significant advantages at posttest were lost during follow-up because of slight deterioration on some measures in the EMDR group and slight continued improvement on some measures in the EFER group.

Supplementary Analyses

To examine the clinical significance of treatment gains, we determined clients' level of endstate functioning using the following five a priori criteria: zero panic attacks at posttest or follow-up and recovery on the ACQ, BSQ, BAI, and avoidance alone scale of the MI. Recovery was defined following procedures proposed by Jacobson and his colleagues (e.g., Jacobson & Truax, 1991). To be classified as having achieved high endstate functioning, clients had to meet at least four of these criteria. Clients meeting two or three criteria and those meeting one or none of the criteria were categorized as having medium and low endstate functioning, respectively.

At posttest, 1 EMDR and none of the EFER or WL clients achieved high endstate functioning. Seven EMDR, 1 EFER, and none of the WL clients achieved medium endstate functioning. Ten EMDR, 17 EFER, and all 12 WL clients were classified as having low endstate functioning. Thus, EMDR produced a greater percentage of clients meeting criteria for moderate or high endstate functioning relative to the WL procedure, p = .024. At follow-up, only 2 clients, one from each treatment group, achieved high endstate functioning; 5 EMDR and 2 EFER clients achieved medium endstate functioning; 9 EMDR and 11 EFER clients were classified as having low endstate functioning.

Discussion

The present study is the first to demonstrate EMDR's advantages over a WL procedure in the treatment of an anxiety disorder other than PTSD. Our results show that EMDR clients' improvement in panic symptoms cannot be explained merely by the effects of repeated testing, continuous monitoring of anxiety symptoms, some attention from mental health professionals, or the passage of time. Nonetheless, these findings do not indicate whether EMDR's effects are greater than those of a credible placebo or as large as those of other treatments for panic disorder with extensive evidence bases (e.g., cognitive-behavior therapy; see Chambless & Gillis, 1994). These important questions are yet to be resolved.

Does eye movement add to the efficacy of EMDR? The results of this partial dismantling study are mixed. At posttest, EMDR clients showed greater improvement than EFER clients on two of five primary measures assessing panic symptoms. In addition, EMDR clients demonstrated greater gains on measures of depression, social adjustment, and endstate functioning. However, 3 months after treatment, EMDR's advantages had disappeared, though both EMDR and EFER clients generally maintained their treatment gains across the follow-up period.

The current findings are somewhat similar to those reported by Shapiro (1989) and Montgomery and Ayllon (1994). Testing EMDR for the treatment of PTSD-related symptoms, these authors found EMDR to be more beneficial than a control procedure lacking the eye movement at posttreatment. The majority of studies testing the role of the eye movement in EMDR, on

the other hand, failed to provide any evidence for the advantage of the eye movement (Boudewyns & Hyer, in press; Boudewyns et al., 1993; Pitman et al., 1996; Renfrey & Spates, 1994; Sanderson & Carpenter, 1992). Methodological and population differences appear to be a plausible explanation for the discrepant findings across studies.

How can we explain EMDR's short-term advantages in the current study? One might speculate that the eye movement provided in vivo exposure to feared body sensations. Indeed, EMDR clients occasionally reported that the eye movement caused them to feel dizzy, disoriented, and anxious. Consequently, one might expect that EMDR would be more beneficial than EFER in reducing clients' fear of bodily sensations and physical concerns. This was not the case. However, one possibility is that the eye movement served as a psychological placebo by enhancing clients' expectation for improvement. Consistent with the current findings, a placebo effect would be especially apparent immediately after treatment but would most likely lack the strength to be sustained over a period of several months. Granted, treatment credibility and expectation for improvement did not differ across the EMDR and EFER groups in the present study, but this finding may be due to the fact that these variables were assessed before treatment began. A more adequate control of expectancy effects would require EMDR's comparison with a control procedure that involves a ritual as compelling as the eye movement in EMDR.

Examination of clients' endstate functioning is sobering. Only one EMDR client achieved high endstate functioning at posttest and none met these criteria at follow-up, suggesting that the lack of differential treatment effects between EMDR and EFER cannot be attributed to a ceiling effect. In part, these results reflect the stringency of the criteria for recovery proposed by Jacobson and his coworkers (e.g., Jacobson & Truax, 1991) as well as the brief intervention we used, which was intended to test the potential of EMDR more than its limits. Even 10 to 16 sessions of the most powerful treatments rarely result in a normalization of panic symptoms, especially when these are complicated by agoraphobia. Estimates of clinically significant change or high endstate functioning for 10 to 16 sessions of cognitive behavioral treatments range from 46% to 86% (Chambless & Gillis, 1993), but meaningful comparisons across studies are hampered by the use of variable and often arbitrary criteria.

In light of the limitations of the present study, several alternative explanations for our findings must be considered. All of the assessment and the majority of the treatment sessions were conducted by Ulrike Feske, and the other therapist was also an EMDR researcher, raising the possibility that unintentional investigator allegiance biases might have favored EMDR. This seems unlikely for several reasons. First, neither of the two therapists had a strong a priori allegiance to EMDR versus EFER. In fact, this study was motivated primarily by Ulrike Feske's skepticism about the dramatic effects attributed to EMDR rather than by her enthusiasm for the procedure. Second, independent raters' evaluations of treatment integrity did not yield any evidence of a therapist bias favoring EMDR or even trends in that direction. Third, client ratings showed that the EMDR and EFER groups did not differ with respect to treatment credibility and nonspecific therapist factors.

In summary, the current study provides initial support for EMDR's efficacy in the treatment of panic disorder with agoraphobia. However, unless and until EMDR is shown to be as efficacious as more strongly evidence-based treatments such as exposure and cognitive-behavior therapy, we suggest that EMDR should not be the first-line treatment for this severe anxiety disorder.

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