

The Effectiveness of EMDR in a Child Guidance Center

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Objective: This study evaluated the effectiveness of adding EMDR to the routine treatment regimen of child therapists. Method: Thirty-nine child guidance center clients were randomly assigned to an experimental group that received EMDR plus the center's routine treatment package or a control group that received only the center's routine treatment package. Results: Analyses of variance found no significant differences in Child Behavior Checklist scores between groups. Subanalyses conducted for 33 clients with elevated pretest scores found moderate effect sizes that approached, but fell short of, statistical significance. Conclusions: These findings raise doubts about notions that EMDR produces rapid and dramatic improvements with children whose emotional and behavioral problems are not narrowly connected to a specific trauma and who require improvisational deviations from the standard EMDR protocol. Further research is needed in light of the special difficulties connected to implementing the EMDR protocol with clients like those in this study.

This article reports a randomized experimental evaluation of the effectiveness of adding Eye Movement Desensitization and Reprocessing (EMDR) to the routine treatment regimen of child therapists in a child guidance center.

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EMDR is a controversial treatment approach that was developed by Shapiro (1989) in the late 1980s. Although Shapiro's recommended EMDR protocol consists of an eight-phase treatment approach, its most notable departure from other forms of psychotherapy involves the use of bilateral stimulation to enhance the desensitization of distressing memories, feelings, and cognitions and to enhance the replacement of negative cognitions with positive ones. Eye movements usually comprise the bilateral stimulation. Other forms of bilateral stimulation include alternating right- and left-hand taps or alternating sounds in the right and left ear for clients with vision problems or who have difficulty thinking about stressful material while concentrating on tracking the therapist's rapidly moving fingers with their eyes. A full description of the EMDR protocol and its theoretical rationale can be found in a text written by Shapiro (1995).

EMDR has been hailed in the popular news media as a possible miracle cure (Cowley & Biddle, 1994). Calling it a "breakthrough therapy," Shapiro and Forrest (1997) have claimed that it can be applied to a wide range of problems with very rapid and long-lasting effects. The number of therapists who have been trained to use EMDR now exceeds 25,000, and many of them are social workers (Herbert et al., in press). Yet the empirical research literature evaluating the efficacy of EMDR has reported inconsistent outcomes.

The seminal study evaluating the effectiveness of EMDR (Shapiro, 1989) was a randomized experiment on 22 people ranging in age from 11 to 53 years old who were experiencing traumatic memories connected to the Vietnam war, childhood sexual abuse, emotional abuse, or sexual or physical assault. After receiving brief EMDR treatment, experimental participants reported that their traumatic memories virtually disappeared and that they experienced dramatic improvements in their cognitions, whereas control participants did not improve. However, methodological issues limited the study's scientific credibility. Outcome was assessed using two subjective scales—the Subjective Units of Disturbance Scale (SUDS) and the Validity of Cognition Scale (VOCS)—that were vulnerable to demand characteristics (Acierino, Hersen, Van Hasselt, Tremont, & Mueser, 1994; Greenwald, 1994a; Herbert & Mueser, 1992). For example, the SUDS is used as part of the EMDR treatment protocol, in which EMDR clinicians are supposed to repeat the eye movements and the SUDS ratings until the SUDS rating falls to near 0 or 1 on a 10-point scale. However, a number of studies—also with

Donald Zappone, who as executive director of the Austin Child Guidance Center allocated agency resources to this study; Francine Shapiro, who provided EMDR training to the clinicians in this study; Carol York, who volunteered supervision to the clinicians in this study; and Ricky Greenwald, who rated videotapes regarding treatment fidelity.

limited methodologies—appeared soon after Shapiro's study and provided additional empirical evidence supporting the effectiveness of EMDR, as reviewed by Acierno et al. (1994), Greenwald (1994a), Herbert and Mueser (1992), Lohr et al. (1992, 1995), and Shapiro (1995, 1996a, 1996b). The studies with limited methodologies included case studies (Kleinknecht, 1993; Kleinknecht & Morgan, 1992; McCann, 1992; Puk, 1991; Wolpe & Abrams, 1991), one-group pretest-posttest designs (Marquis, 1991), and a survey of clinicians (Lipke, 1992). Not every case study has reported desirable results. A more recent one by Kaplan and Manicavasagar (1998) reported the case of a man with an adjustment disorder who, after EMDR treatment, developed severe panic attacks and became acutely suicidal.

Several recent EMDR studies have used randomized experimental designs and supported the effectiveness of EMDR as compared with groups receiving no treatment or alternative forms of treatment (Carlson, Chemtob, Rusnak, Hedlund, & Muraoka, 1996; Edmond et al., 1999; Marcus, Marquis, & Sakai, 1996; Wilson, Becker, & Tinker, 1995). However, the results of other experiments involving component analysis have raised questions as to whether EMDR is as effective as previously validated cognitive-behavioral treatments involving imaginal exposure, such as systematic desensitization, flooding, and covert rehearsal (Bauman & Melnyk, 1994; Boudewyns, Stwertka, Hyer, Albecht, & Speer, 1993; Feske & Goldstein, 1997; Foley & Spates, 1995; Gosselin & Mathews, 1995; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998; Muris, Merckelbach, van Haften, & Mayer, 1997; Pitman et al., 1993; Renfry & Spates, 1994; Sanderson & Carpenter, 1992). The majority of these studies concluded that eye movements are not an essential component in achieving the observed effects of EMDR and that EMDR is no more effective than other exposure-based therapies.

Reviewers of these studies have argued that the EMDR movement is simply exploiting the success of exposure-based therapies by adding bilateral stimulation—the component that distinguishes EMDR from exposure-based therapies—as a completely unnecessary placebo-like gimmick (Feske & Goldstein, 1997; Lohr, Tolin, & Lilienfeld, 1998; Rosen, 1999). EMDR proponents have criticized the component analysis studies primarily on grounds of intervention fidelity, pointing to the lack of sufficient EMDR training by the therapists in these studies or other ways in which the tested EMDR procedure deviated from the recommended protocol (Greenwald, 1994a; Shapiro, 1996a, 1996b). The retort to the Greenwald and Shapiro critique argues that the component analysis studies contained adequate fidelity to the EMDR protocol at the time they were conducted, but that Shapiro keeps changing the EMDR protocol, the EMDR certification requirements, and the consequent criteria for treatment fidelity in ways that make it impossible for any

researcher to produce a study immune to potential criticism regarding treatment fidelity from EMDR proponents (Rosen, 1999).

Regardless of how one views this heated debate, it is important to note that most of the research supporting EMDR to date has been done on adults suffering from relatively circumscribed trauma-based problems and post-traumatic stress disorders (PTSD) connected to specific traumatic experiences. In light of the aforementioned methodological issues in that research and the lack of support for eye movements in the component analysis studies, there is disagreement as to whether EMDR has yet been validated as "probably efficacious" for PTSD (Chambless et al., 1998; Foa & Meadows, 1997; Herbert et al., in press; Keane, 1998). Nevertheless, proponents of EMDR today are advocating its applicability to a very wide range of problems, including less circumscribed ones that may not be caused by trauma, such as self-esteem issues, agoraphobia, multiple personality disorder, somatic disorders, smoking cessation, chronic depression, obsessive-compulsive disorder, and eating disorders (Feske & Goldstein, 1997; Greenwald, 1994a; Herbert et al., in press; Marquis, 1991; Shapiro, 1995).

EMDR is also being proposed as useful in treating children, including those as young as 2 years old and perhaps younger (Tinker & Wilson, 1999). Among the child problems for which it is being recommended are anxiety and depression unconnected to trauma, attention-deficit/hyperactivity disorder (ADHD), conduct disorders, learning difficulties, reactive attachment disorders, and somatiform disorders (Tinker & Wilson, 1999; York, 1994). There is, however, a paucity of rigorously controlled research evaluating the effectiveness of EMDR exclusively with children or adolescents. Pellicer (1993) reported a case study in which one session of EMDR resulted in a complete remission of a 10-year-old girl's nightmares. Greenwald (1994b) reported five case studies in which trauma symptoms connected to experiencing a hurricane were alleviated as indicated by the SUDS-like subjective measure that Greenwald acknowledged to be possibly biased. Using a quasi-experimental design, Puffer, Greenwald, and Elrod (1998) obtained results supporting the effectiveness of a single session of EMDR in reducing trauma symptoms among children and adolescents who had experienced a single trauma or loss.

Three randomized experiments have assessed EMDR's effectiveness with a sample composed exclusively of children. One experiment used a randomized lagged-groups design to evaluate EMDR's effects with elementary school children who were experiencing disaster-related PTSD symptoms after a hurricane (Chemtob, Nakashima, Hamada, & Carlson, 1998). They found statistically significant and strong EMDR effects in alleviating the symptoms as indicated by standardized measures. Two recent experiments

by Muris and his associates compared the efficacy of EMDR with that of exposure in vivo in the treatment of spider-phobic children. Muris et al. (1997) found positive effects for EMDR, particularly on self-report measures, but also found that exposure in vivo had superior effects in reducing avoidance behaviors. They concluded that exposure in vivo is the treatment of choice for this type of phobia, and that EMDR adds nothing of value to it. In their other experiment, exposure in vivo produced significant improvement on behavioral and self-reported outcome measures, whereas EMDR produced significant improvement only on self-reported spider fear. Also, providing EMDR before providing exposure in vivo did not enhance the effectiveness of the exposure in vivo treatment (Muris et al., 1998).

In light of the uneven results of the foregoing studies, additional controlled studies are needed assessing EMDR's effectiveness with children. Another reason for more studies has to do with the nature of the EMDR protocol and target problems in the above studies with children. Each of the randomized experiments with children refers to using a traditional EMDR protocol that does not deviate markedly from the adult EMDR protocol, and each applies it exclusively to a very circumscribed problem, such as one specific type of fear or reactions to a specific trauma. None has tested the claims that EMDR can be effective with children experiencing a wider range of emotional or behavioral problems that are less circumscribed and not connected to a specific trauma. Moreover, proponents of using EMDR with young children recommend a treatment approach that often must deviate from the adult EMDR protocol (Greenwald, 1993). With adults, the protocol involves a highly structured 90-minute procedure. Many children, however, have neither the attention span nor the cognitive capacity to handle the adult procedure. Child therapists using EMDR, therefore, may be advised to improvise quite a bit with each case and to deviate from the adult procedure in unsystematic ways. With young children, the EMDR procedure may have to be done very quickly—perhaps in just a few minutes—amid a play therapy session. Commonly, various stages of the adult protocol are skipped, and the clinician may begin bilateral stimulation regarding a positive thought, saving negative material for a later date. Also, the therapist may not go back to old memories; instead, the focus may be on thoughts impeding present functioning. The absence of randomized experimental evaluations of the effectiveness of EMDR with children in clinical settings requiring these deviations from the traditional adult protocol has been an important gap. The current study attempts to alleviate this gap by testing the following two hypotheses:

Hypothesis 1: Children receiving EMDR in addition to a routine treatment package in a child guidance center will show more improvement in internalizing

T-scores on the Achenbach Child Behavior Checklist than will children who receive only the routine treatment package without EMDR.

Hypothesis 2: Children receiving EMDR in addition to a routine treatment package in a child guidance center will show more improvement in externalizing *T*-scores on the Achenbach Child Behavior Checklist than will children who receive only the routine treatment package without EMDR.

BACKGROUND INFORMATION REGARDING THE CURRENT STUDY

To best understand the rationale for the design of the current study, some background information is needed. In the early 1990s, the lead author learned of the early empirical support for EMDR, its use with children, and the need for more outcome research. Intrigued by what he learned, he contacted Shapiro, EMDR's founder, to begin contemplating how he might contribute to the emerging empirical assessment of EMDR. Shapiro expressed a commitment to support scientific assessment of EMDR. Wanting to foster treatment fidelity in outcome investigations, Shapiro offered to provide basic and advanced clinical training in EMDR to the lead author free of charge. After receiving this training, the lead author, who had a Texas social work license as an advanced clinical practitioner but was working exclusively in academia, sought to find an appropriate social work agency where he could practice EMDR with clients and perhaps develop a receptivity to doing outcome research on it. The Austin Child Guidance Center (ACGC) turned out to be an ideal fit. Not only were its executive director and clinical director (a social worker) receptive to the notion of permitting this controversial new therapy to be employed clinically in their agency, they were eager to support randomized evaluations that would enable their center to become a clinical research–service setting where promising new advances in clinical practice could be provided to clients and tested out. Social work researchers familiar with long-standing resistances to rigorous research in social work practice settings—and especially resistances to randomized experiments—can appreciate the lead author's delight and surprise in finding such receptivity (Rubin & Babbie, 1997).

After the lead author volunteered as a child therapist at the ACGC for a year, during which time he helped the center's child therapists (about half of whom were social workers) learn of the potential effectiveness of EMDR with their target population, ACGC clinicians and administration were ready to participate in the randomized experiment on EMDR's effectiveness being reported in this article. They projected that in a year's time more than 100 clients will have participated in the study, which the lead author noted would

give it adequate statistical power, exceeding .80, assuming a moderate effect size (Rubin & Babbie, 1997).

Knowing how rare it is to find an agency willing to do this sort of research, the lead author recognized the necessity of making some methodological compromises. Trying to enhance experimental design power by limiting the study to only one diagnostic category would be infeasible. To obtain a large enough sample in this modestly sized agency, it would be necessary to include all EMDR-appropriate referrals—across different diagnostic categories. (The appropriateness was based on the judgments of EMDR-trained clinicians that the referred clients would benefit from EMDR treatment.) Agency procedures and resource limitations also precluded conducting a battery of standardized diagnostic tests on all potential referrals to ensure that only clients with scores beyond clinical cutoff points would be referred to the study. The lead author also chose to use uncomplicated measurement procedures for pretests and posttests so as not to alienate agency practitioners. Restricting measurement to the Achenbach Child Behavior Checklist (CBCL) (which we will elaborate in the Measurement section of this article), completed by parents at pretest and posttest in the agency waiting area while the child was seeing the therapist, fit well with ongoing agency practices because this was already a routine procedure in the center for children needing assessment for ADHD.

The lead author chose not to try to overcome any of the aforementioned resource limitations through a drawn out process of pursuing a large research grant from a major funding source. He feared that the time required to succeed in such a process might result in the loss of agency momentum for the study. The decision to implement the study without major funding was sealed when Shapiro offered to support it by training the ACGC child therapists in EMDR for free; a senior facilitator of the EMDR Institute known for her special expertise in EMDR with children offered to volunteer monthly EMDR group supervision to the ACGC therapists without remuneration, and the modestly salaried ACGC therapists responded by agreeing to pay for their own transportation and per diem expenses to obtain the training.

One additional background consideration is worth mentioning before proceeding to the study's methodology. It would have been infeasible and inappropriate to attempt to design a study comparing a pure EMDR intervention (with no additional treatment components) with a pure (no treatment) control condition. Both conditions would have been unacceptable to ACGC staff. Moreover, at the time this study was designed (and continuing today), clinicians being trained in EMDR were instructed not to use it in isolation as some sort of magic bullet. Instead, they were (and are) instructed to use it in combination—as one more resource in their therapeutic arsenal—

with whatever ongoing clinical approaches they currently employ with clients. This instruction applies in spades to child therapists, particularly those working with young children or children with problems more complicated than specific phobias or reactions to experiencing a hurricane because they are instructed that they should often improvise and deviate idiosyncratically from the adult EMDR protocol and briefly weave EMDR procedures in with whatever other modalities they are using. In his monograph on using EMDR with children, for example, Greenwald (1993) recommends various improvisations when working with certain types of children. These include, but are not limited to, children who need to be motivated for treatment, cannot tolerate the slow pace of the adult protocol, are unwilling to communicate about the targeted source of distress, are oppositional, have ADHD, or have been abused. These conditions apply to most of the ACGC clientele. Consequently, attempting to offer a pure EMDR condition in the ACGC setting would have contradicted intervention fidelity from the outset in the study's conception. Thus, the most appropriate research question for the current study was to ask whether adding the EMDR treatment component to the routine ACGC treatment package significantly improved treatment outcome. (This is not to suggest that testing a pure EMDR intervention with children is always inappropriate. Testing a pure approach may be the ideal way to proceed in some studies, particularly studies of older children and children with more circumscribed problems stemming from a specific phobia, such as spiders, or a specific trauma, such as a hurricane.)

METHOD

Sample

In this study, 39 clients aged 6 to 15 years old consented to participate. The sample size of 39 took 3 years to accumulate and was much less than the more than 100 cases projected by the ACGC staff to be referred to the study within 1 year. Despite the undesirable statistical power of 39 cases, the lead author decided to stop what was supposed to be a 1-year study after 3 years rather than go on another 3 or more years in the hopes of having adequate power.

Clients were referred to the study by the center's seven EMDR-trained child therapists. These therapists provided the assessed treatment to both the experimental group (EMDR-plus) and the control group (routine treatment package only). The referred children had already begun receiving the routine treatment package at the time of referral to the study. The rationale for

referral was simply that these EMDR-trained therapists believed that the child would be appropriate for EMDR treatment and would benefit significantly from adding it to the routine package. Part of EMDR training involves the assessment of whether clients would be appropriate for and benefit from EMDR treatment. The only eligibility criterion beyond being 6 years or older and judged to be appropriate by the clinician was that the referred children not be experiencing ongoing physical or sexual abuse. Experiencing such abuse in the past would not disqualify children. This criterion is consistent with what is taught in EMDR training about the determination of appropriateness of clients for EMDR treatment.

The characteristics of the sample are displayed in Table 1. Of the 39 participants in the study, 25 had either experienced abuse or witnessed domestic violence. The mean age of participants was 9.3 ($SD = 2.7$); 20 were female and 19 were male. Of the participants, 9 were ethnic minorities (3 Hispanics and 6 African Americans). All but 6 had elevated pretest CBCL scores above the clinical cutting point of 60 on either the internalizing or externalizing scale, and 19 (49%) lived in single-parent families (18 with their mother, 1 with their father). Another 5 participants (13%) had joint custody arrangements, 5 others (13%) did not live with either parent, 2 (5%) lived with a mother and a boyfriend or partner, and the remaining 8 (21%) lived in two-parent families.

Of the 39 participants, 13 (33%) had ADHD included as part of their treatment plan primary or secondary diagnoses. Dysthymia was included for 10 (26%) of them, adjustment disorder was mentioned for 7 (18%), PTSD was mentioned for 6 (15%), parent-child relational disorder or sibling relational disorder was indicated for 5 (13%), 2 (5%) had anxiety disorders, and 2 (5%) had reading disorders. The following were mentioned for 1 child each: developmental coordination disorder, depressive disorder, and obsessive compulsive disorder. Of the participants, 13 (33%) were taking psychotropic medications, and 16 (41%) had a parent suffering from a diagnosed mental disorder.

Measurement

Outcome was assessed by having one parent complete the CBCL at the point of entry to the study (when informed consent was granted) and again at posttesting 6 months later. In most cases, the clinicians participating in this study were able to have the parent complete the CBCL while they waited in the center's waiting room area during their child's therapy session. In cases where the parent was unable to wait, they took the forms with them and

TABLE 1: Sample Characteristics by Group

	<i>Experimental Group (EMDR plus routine treatment)</i>	<i>Control Group (routine treatment only)</i>	<i>Total</i>
Gender			
Male	11	8	19
Female	12	8	20
Ethnicity			
Minority	5	4	9
Non-minority	18	12	30
Mean age	8.8	10.1	9.3
Elevated pretest scores (>59)			
Yes	19	14	33
No	4	2	6
ADHD diagnosis			
Yes	6	7	13
No	17	9	26
Medicated			
Yes	5	8	13
No	18	8	26
Parent mental illness			
Yes	10	6	23
No	13	10	23
Prior Abuse*			
Yes	21	4	25
No	2	12	14

NOTE: ADHD = attention-deficit/hyperactivity disorder

* $p < .01$.

completed them at home. In two-parent families, the parent selected to complete the study was the one who, in the clinician's judgment, had the most opportunities to observe the child's behavior.

The CBCL is widely regarded as one of the best behavioral rating scales for assessing emotional and behavioral disorders in children, based on its breadth and diversity of items, standardization and norms, and reliability and validity (Achenbach & Edelbrock, 1983; Barkley, 1988; Beck, 1987; Martin, Hooper, & Snow, 1986; Mash & Terdal, 1988). It contains over 100 items referring to child behaviors. Beside each item is a 3-point scale ranging from 2 (*very or often true of their child*), 1 (*somewhat or sometimes true of their child*), to 0 (*not true of their child*). Internalizing items refer to things such as crying, fears, withdrawing, anxiety, sadness, timidity, and so on. Externalizing items refer to things like arguing, fighting, cruelty, attention seeking,

disobedience, temper tantrums, and so on. The higher the score, the worse the behavior problems.

Of the 39 participating clients, 33 had elevated pretest scores above the clinical cutting point of 60 on either the internalizing or externalizing CBCL scale. Differences in mean *T*-scores at pretest between the experimental and control groups were not statistically significant. The mean externalizing *T*-scores at pretest were 65.3 (*SD* = 13.9) for experimentals and 68.6 (*SD* = 10.7) for controls ($t = -.79$, $df = 37$, $p = .43$). The respective comparison of internalizing pretest *T*-scores was 65.7 (*SD* = 10.9) for experimentals and 71.0 (*SD* = 7.7) for controls ($t = -1.66$, $df = 37$, $p = .11$).

Design and Procedure

Once the referred child and parent(s) granted informed consent to participate in the study, the child was randomly assigned to either the experimental or control condition. In either case, the child continued seeing the same EMDR-trained therapist. If they were assigned to the experimental group, the therapist would include at least five sessions in which EMDR took place in the treatment regimen. If the child was assigned to the control group, the therapist simply continued the routine treatment package without providing any EMDR. The five or more sessions in which EMDR took place did not represent additional sessions for the experimental group. Both groups received the same extent of treatment. What differed was merely whether EMDR procedures were included in the treatment package.

Most of the children in each treatment condition (13 experimentals and 10 controls) received a combination of individual play therapy, group therapy, and family therapy. Other than the fact that all experimental children (and no controls) also received EMDR, the difference in treatment packages between the two groups was not statistically significant. For example, five children in each group received play therapy plus family therapy, and the group plus family combination was received by 2 experimentals and 1 control; 3 children in the experimental group and 0 controls received individual play therapy without any group or family therapy. The median number of therapy sessions provided was 21 for the experimental group and 22 for the control group.

Using the same therapists for both treatment conditions raised the question of therapist bias. Perhaps the therapists would be more enthusiastic with the EMDR clients than with the controls. In designing the study, however, the lead author recognized that given the limited number of therapists and clients in the agency setting, there was no alternative preferable to this arrangement. All the center's therapists wanted EMDR training, and to deny some would have jeopardized receptivity to the study and perhaps created more serious

potential biases. Having different therapists for the two groups with such a small sample of therapists would create the very plausible possibility that the quality of the therapists in the two groups would be significantly different. Moreover, these therapists strongly believed in the efficacy of the interventions they offered in the routine treatment package, which consisted primarily of nondirective individual and group play therapy and family therapy. (Not all clients received all three modalities; each received those modalities indicated by the therapist's clinical judgment.) Because it was not the case that therapists were providing services that they didn't believe in to control clients, the potential for clinician bias in providing the tested interventions, though real, seemed a much lesser evil than the possibility that different therapists for the two groups might differ in quality.

Because many of the children receiving ACGC services had siblings who were also receiving those services, entire sets of siblings referred to the study were randomly assigned to either the experimental or control condition. This was done only if the referring therapists deemed all referred siblings appropriate EMDR referrals. (If they were not deemed appropriate for EMDR treatment, they were not referred to the study.) The decision to refer siblings as sets to one condition or the other was intended to avoid generalization of effects in which an experimental group sibling's improvement might beneficially impact a control group sibling. It also was intended to limit compensatory rivalry by control group siblings as well as to avoid pragmatic family concerns. Randomly assigning entire sets of siblings, combined with random sampling error in such a small sample, resulted in having 23 clients in the experimental condition and 16 in the control condition. In addition to the 39 clients who completed the study, 12 clients dropped out of the study shortly after being pretested: 8 were in the EMDR group. Of these, 7 dropped out before receiving any sessions in which EMDR was provided, and 1 dropped out at a point after receiving one session in which EMDR was provided. The study's dropout rate is consistent with the tendency in the center for cases to stay in treatment for less than 6 months—the amount of time required for completing the study.

Randomly dividing cases into two groups does not guarantee that the two groups will be equivalent in every relevant respect. We noted earlier that differences in mean *T*-scores at pretest between the experimental and control groups were not statistically significant, nor were differences in gender, age, ethnicity, diagnosis, taking psychotropic medications, or having a parent suffering from a diagnosed mental disorder. The characteristics of the participants in each group are displayed in Table 1. The only statistically significant difference affecting the comparability of the two groups was in whether the

child had ever experienced abuse or witnessed domestic violence ($p < .01$, $V = .71$). All but 2 of the 23 experimental group children had experienced abuse or witnessed domestic violence, as compared to only 4 of the 16 control group children. To assess the potential for this strong difference to confound our results, analyses of covariance were conducted comparing pretest with posttest change on the study's two outcome indicators of children who had and had not experienced abuse or witnessed domestic violence. Very little difference was found between the two groups on either indicator, and neither comparison approached statistical significance. On the internalizing scale, for example, the posttest mean (adjusted for the pretest covariate) for children who had experienced abuse or witnessed domestic violence was 63.0, compared with 64.1 for children who had not ($p = .75$). On the externalizing scale, the posttest mean (adjusted for the pretest covariate) for children who had experienced abuse or witnessed domestic violence was 62.6, compared with 63.4 for children who had not ($p = .79$).

Treatment Fidelity

As noted earlier, one of the controversies in the EMDR literature revolves around whether the negative findings of some studies can be attributed to EMDR therapists who were not adequately trained in EMDR or who implemented the intervention improperly or both. Several steps were taken to avoid that problem in the current study. First, all the therapists were experienced in treating children and received both levels (level-1 and level-2 [advanced]) EMDR training. Second, after receiving their EMDR training, the therapists received monthly group supervision in EMDR from one of the EMDR Institute's senior facilitators. Third, both the supervisor and an independent external rater (who authored an EMDR Institute-sponsored monograph on EMDR with children) viewed and rated videotapes of EMDR sessions made during the study by study therapists. Both indicated that in each tape EMDR was being implemented properly. Three of the seven therapists in the study were MSW-level social workers licensed as advanced clinical practitioners. Three were master's level psychologists. One was a doctorate-level psychologist.

RESULTS

A multiple analysis of covariance (MANCOVA) assessed the overall probability of committing a Type I error in rejecting either of our two null hypotheses. The results of the MANCOVA were not statistically significant

($p = .467$). The effect size was .04, and the power of the MANCOVA for that effect size was .27 at the .10 significance level. (We used an alpha of .10 instead of .05 to compensate for the low power due to our small sample size.) In light of our low statistical power and the consequent potential importance of a Type II error, two univariate analyses of covariance were also conducted—one for each hypothesis. With a sample size of 39 cases, our univariate Type II error probability for each hypothesis was approximately .40 assuming a medium effect size and a two-tailed alpha of .10 (Rubin & Babbie, 1997). With a Bonferroni adjustment, the .10 gets divided by 2 (for the two outcome measures), yielding a .05 alpha after correcting for inflation. With or without the Bonferroni adjustment, however, none of our univariate results were statistically significant, and neither null hypothesis could be rejected.

Hypothesis 1

Our first hypothesis was that children receiving EMDR in addition to a routine treatment package in a child guidance center will show more improvement in internalizing T -scores on the CBCL than will children who receive only the routine treatment package without EMDR. As indicated above, this hypothesis was not supported. Although the EMDR group's internalizing posttest mean (adjusted for the pretest covariate) of 61.97 was lower (better) than the corresponding control mean of 65.48, the p was greater than .30 for this difference. The partial beta (adjusted for the covariate) was only .14, indicating that even if a Type II error were being committed, the magnitude of the relationship would be weak, with less than 2% of variance explained. This weak magnitude, combined with the fact that the EMDR group's posttest mean was still above the clinical cutting point, suggests that were we to get the same results with a much larger sample, even statistical significance would be offset by the lack of clinical significance. (The unadjusted pretest and posttest means and standard deviations for each group are displayed in Table 2.)

Recognizing that the inclusion of some cases in the sample that did not have elevated pretest scores might be too stringent a test of EMDR's effectiveness, we decided (in advance of doing the analysis) to supplement the foregoing analysis with one that included only those cases with elevated pretest scores. The results of that analysis provided some very tentative evidence for the possible effectiveness of adding EMDR to the treatment package but still fell short of statistical significance. For the 29 cases with elevated internalizing pretest scores (60 or greater), the EMDR group's

TABLE 2: Mean Internalizing and Externalizing T-Scores by Group and Time, All Cases

Scale	Group	n	SD		M ^a	
			Pre	Post	Pre	Post
Internalizing	Experimental (EMDR plus routine treatment)	23	10.9	13.0	65.7	60.3
	Control (routine treatment only)	16	7.7	11.0	71.0	67.8
Externalizing	Experimental (EMDR plus routine treatment)	23	13.9	11.2	65.3	61.8
	Control (routine treatment only)	16	10.7	11.5	68.6	64.6

a. None of the experimental vs. control group differences was statistically significant.

internalizing posttest mean (adjusted for the pretest covariate) of 64.36 was better than the corresponding control mean of 70.04 and was not terribly far from significance ($p = .11$). With a partial beta (adjusted for the covariate) of .27, a statistically significant difference of this magnitude would be of moderate strength (Rubin & Babbie, 1997) and have potential clinical significance. The potential consequences of a Type II error for this finding, therefore, should not be dismissed too lightly. (The unadjusted pretest and posttest means and standard deviations for each group with elevated pretest scores are displayed in Table 3.)

Hypothesis 2

Our second hypothesis was that children receiving EMDR in addition to a routine treatment package in a child guidance center will show more improvement in externalizing *T* scores on the CBCL than will children who receive only the routine treatment package without EMDR. As indicated above, this hypothesis was not supported either. The EMDR group's externalizing posttest mean (adjusted for the pretest covariate) of 62.57 was only slightly lower than the corresponding control mean of 63.42. The p value for this difference was greater than .76, and the partial beta was only .04. When we included only the 28 cases with elevated externalizing pretest scores (60 or greater), the results were still not statistically significant ($p = .17$). However, the partial beta rose to .27, with an EMDR posttest mean (adjusted for the pretest covariate) of 66.06 compared with a control mean of 70.32.

TABLE 3: Mean Internalizing and Externalizing T-Scores by Group and Time, Cases With Elevated Pretest Scores Only

Scale	Group	n	SD		M ^a	
			Pre	Post	Pre	Post
Internalizing	Experimental (EMDR plus routine treatment)	15	6.5	11.0	72.5	64.1
	Control (routine treatment only)	14	5.5	9.3	73.1	70.3
Externalizing	Experimental (EMDR plus routine treatment)	16	7.0	9.4	73.3	66.1
	Control (routine treatment only)	12	5.7	4.8	73.7	70.3

a. None of the experimental vs. control group differences was statistically significant.

DISCUSSION AND APPLICATIONS TO SOCIAL WORK PRACTICE

None of the hypotheses testing results in this study was statistically significant. This is likely to disappoint many clinicians who are hoping that EMDR will live up to the expectations that some have expressed about it. It certainly disappointed the clinicians who participated in this study. One issue bearing on our null results is the fact that 16 (41%) of the participants had a parent suffering from a diagnosed mental disorder (including 10 of the 23 experimental children and 6 of the 16 control children). Of the 16 parents who had a diagnosed mental disorder, 12 completed the CBCL. Although the clinicians who participated in the study did not mention this issue during the study planning phase, after seeing our null findings, some of them questioned the validity of outcome ratings by parents whose disorders might interfere with their propensity to detect therapeutic progress. Perhaps some of these parents might even negatively interpret certain behaviors that in clinicians' views indicated improvement. In light of this ex post facto notion, we conducted another analysis of our outcome findings, this time excluding the 12 parents with a diagnosed mental disorder from the analysis. We did this including all 27 of the remaining cases in the analysis, and then further limited the analysis to cases with elevated pretest scores. In both analyses, the results were virtually identical to those of the analyses that included the parents with a diagnosed mental disorder. In both, the null hypothesis could not be rejected, and the univariate partial betas were .28 and .29 respectively for the internalizing and externalizing scales for cases with elevated pretest scores.

Because partial betas near .30 are considered to represent moderate (average) effect sizes (Rubin & Babbie, 1997) and because of our study's low statistical power, EMDR advocates can reasonably argue that Type II error considerations imply the need for further research on the possible effects of EMDR with children who have elevated CBCL pretest scores, like those in our study. Two counterarguments, however, could be made against interpreting our effect sizes (for children with elevated pretest scores) as clinically significant. One is that our effect sizes represent an upper limit for the specific effects of EMDR above and beyond exposure-based interventions because our control group clients did not receive exposure-based therapy. The second is that the mean posttest scores of the EMDR-treated children remained above the CBCL clinical cutting point of 60. Thus, even the rosiest possible depiction of our moderate effect sizes would be a far cry from the expectations raised by those who depict EMDR as a breakthrough therapy that produces dramatic results in just a handful of sessions or less.

Although our results certainly raise doubts about the efficacy of adding EMDR to the routine intervention package when treating clients like those in our study, readers should not make the sweeping generalization that our study indicates that EMDR is ineffective with children. More research is needed before that generalization would be warranted. One reason for more research is that our study contained several limitations. We did not record, for example, the total number of minutes of EMDR treatment received by each child. Maybe a larger dosage of EMDR minutes would produce stronger effects. Also, a prime methodological strength of our study—random assignment—was undermined to some degree by our experimental mortality after the pretest. Likewise, the necessity of randomly assigning entire sets of siblings to the experimental or control condition may have resulted in a violation of statistical independence.

Another reason for more research is that our findings do not bear on the debate about the efficacy of the more traditional EMDR protocol with children with more circumscribed problems connected to a specific trauma. The ages and clinical problems of many of the children in our study required our child therapists to deviate from the traditional EMDR protocol and innovate in idiosyncratic ways with each child. Although the clinical literature on EMDR training encourages such improvisations with children like these, and although these improvisations were done under supervision from a senior facilitator of the EMDR Institute, implementing the EMDR procedure even for several minutes can be quite a challenge with young children with limited attention spans or who are oppositional or resistant to treatment. Consider, for example, the following excerpt from a qualitative analysis of one

therapist's log in this study regarding a 6-year-old EMDR client (the name has been changed to protect the client's identity):

Ava was fairly compliant, but seemed bored and kept asking how much longer. . . . When EMDR protocol was begun Ava was unable to give a negative cognition. She seemed not to understand what was meant. So, instead of following protocol, after safe place was established, the anger control technique was used. . . . Ava preferred up and down eye movements but was unable to follow with eyes. When reminded to look at therapist's hands, she ended up moving her head up and down, as if nodding.

Also illustrative is the following excerpt regarding another 6-year-old client of a different therapist:

Eve [fictitious name] was very resistant to EMDR process. She is a very active, creative child who seemed annoyed at EMDR because it took up her "playing" time. . . . She refused to look at therapist's hands, and would stare off into space in an oppositional manner. Finally, she was given control of the situation: She was told to create her own object that she would look at during eye movement passes. She used art materials to do this. She came up with the idea of "practicing" on the therapist, which I think made her feel more in control. She slowly became more accepting of the process over time. Eventually, the method she preferred was writing on a dry-erase board to do eye movement passes and to communicate. She had markers in both hands, and would make marks on the board, alternating hands for bilateral movement. (She also asked therapist to tap her shoulders from behind.) During EMDR Eve would only communicate with therapist by writing or drawing. She would not speak. (I think this was due partly to her learning how to write and read. She would spell every chance she got, even during non-EMDR sessions.) With Eve, most EMDR sessions were used installing positive cognitions rather than working through negative events, at her request.

One more excerpt will illustrate the special challenge of doing EMDR with children who were traumatized severely at an early age before language was fully developed and who thus must process intense feelings without the benefit of adult verbalization. The excerpt is as follows:

[Bob was a] very difficult, resistant client. At first [he] refused to have anything to do with EMDR . . . he refused to look at my hands, and seemed to refuse just to be oppositional. He liked the idea of coming up with his own object to look at. . . . Bob came up with the idea of practicing on the therapist first. . . . However . . . Bob never warmed up to the EMDR procedure, and continued to be resistant every single time it was used. The only time he complied with therapist's instructions was when he used slapping motions or hitting motions on the therapist's hands for bilateral movement. He refused to look at therapist's hands and hates to be touched . . . [severe abuse at age 3-4] . . . he seems so agi-

tated by the process, and his behavior was extremely aggressive. He was slapping or "spanking" therapist's hands so hard that it was uncomfortable. . . . He refused any other common methods. So therapist chose the bilateral snapping or auditory option. Bob also felt intruded upon, and he yelled at therapist to "get out of my personal body space!"

The foregoing excerpts illustrate the inappropriateness of generalizing our findings to other child target groups. Older children might benefit more from EMDR than the children in our study seemed to. So might children whose problems are more likely to be circumscribed and who are less likely to be resistant and oppositional than was the case in our sample. Readers are reminded that informed consent was secured from all the children participating in this study. As Greenwald (1993) has observed, some children agree to begin EMDR treatment but later become resistant. Rather than abandon EMDR treatment, Greenwald recommends creatively using improvisational EMDR procedures to alleviate their resistance.

Pragmatic requirements necessitated our having a diagnostically heterogeneous sample. The results might be different for a diagnostically homogeneous sample. Although our sample was diagnostically heterogeneous, most of the children receiving EMDR had experienced abuse or witnessed domestic violence. For some of them this occurred at an early age, before language was fully developed. According to the psychobiological research of van der Kolk, Burbridge, and Suzuki (1997), children who are traumatized this early in life have a greater hypersensitivity to the distress. Also, most of the children in our sample had experienced a variety of ongoing problems and were not responding in an acute fashion to one trauma (like a hurricane). Some of them had worked on their traumas in treatment before. In the judgment of the clinicians participating in our study, "sealing over" had occurred for these children. That is, having already worked on the trauma in the past, they were resistant to any direct therapeutic attempt to revisit it, be that with EMDR or any other direct treatment approach. Thus, our results do not pertain to the effectiveness of applying the traditional EMDR protocol to children with more circumscribed problems connected to a specific trauma (like a hurricane).

In conclusion, more research is recommended to assess the effectiveness of EMDR with children like those in our study and with other types of children. Additional study also is needed to compare EMDR treatment with exposure-based treatments. While awaiting the results of further research on the effectiveness of EMDR with children, we advise proponents as well as potential utilizers of EMDR to exercise appropriate caution when considering its effectiveness with children like those in our study. Although our

results are not definitive, they certainly raise doubts about notions of rapid and dramatic improvements. They also imply that clinicians should be mindful of the difficulties in applying EMDR with some children and the fact that its technology is still unfolding for those children who require improvisational deviations from the traditional EMDR protocol.

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