

Practice

Effectiveness of MASTR/EMDR Therapy for Traumatized Adolescents

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This study examined MASTR/EMDR, a trauma-focused treatment for traumatized youth taken in charge by youth protective services. Participants were 40 adolescents who were exhibiting conduct problems and internalizing and externalizing behaviors and who had been exposed to maltreatment. Participants were randomly assigned to MASTR/EMDR treatment or to a routine care condition. Self-report questionnaires and semistructured interviews were administered to participants and one of their parents/caregivers at three points in time: pretreatment, post treatment (12 weeks), and follow-up (12 weeks). Repeated measures analyses of covariance showed that participants in the experimental group had significant improvements in their trauma symptoms and behavioral problems compared with the control group at the posttreatment evaluation. These effects were maintained at a 3-month follow-up. Results support the effectiveness of MASTR/EMDR.

Keywords trauma, EMDR, MASTR, treatment outcome, adolescents, randomized controlled trial

Child maltreatment (i.e., sexual, physical, and emotional abuse and neglect) has high prevalence rates and accounts for a large proportion of cases of childhood trauma. Recent yearly counts show that 826,000 cases of maltreatment were substantiated in the United States (Leventhal, 2003), whereas 60,980 were substantiated in Canada (Trocmé & Wolfe, 2001). These numbers suggest that a significant number of children and adolescents face traumatic experiences that can modify their normal development. However, adolescents often resist pursuing psychological treatments that could help them face their difficulties. The present study examined the effectiveness of a new treatment specifically aimed at reducing post-trauma sequelae for adolescents. This new treatment combines a trauma-focused treatment, eye movement desensitization and reprocessing (EMDR), with a treatment incorporating empirically validated strategies for youth with conduct problems, motivation–adaptive skills–trauma resolution (MASTR).

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Effects of Exposure to Trauma

Meta-analyses and literature reviews have compared studies examining the effects of maltreatment on youth. Problems include dependency, problematic attachment relationships (Cicchetti & Toth, 2005), affective difficulties, internalizing problems, antisocial tendencies, aggression, externalizing problems (Cicchetti & Toth, 2005; Margolin & Gordis, 2000), and poor school adaptation (Cicchetti & Toth, 2005; Margolin & Gordis, 2000; Veltman & Browne, 2001). Difficulties ensuing from trauma have often been considered under the posttraumatic stress disorder (PTSD) nomenclature (American Psychiatric Association, 2000). PTSD includes symptoms of re-experiencing, avoidance, general numbing, and increased arousal. These symptoms often result from children's exposure to trauma (Boney-McCoy & Finkelhor, 1995; Weine, Becker, Levy, Edell, & McGlashan, 1997).

In addition, several theorists have focused on the relationship between trauma and conduct problems (CPs) emerging during adolescence (Dodge, Bates, & Pettit, 1990; Greenwald, 2002b; Heide & Solomon, 2006; Jonson-Reid, 1998; Kaufman & Widom, 1999; Widom, Schuck, & White, 2006). Greenwald (2002b) highlights the role of trauma in developing CPs because (a) violence begets violence, (b) youth with CPs have high rates of trauma history and trauma symptoms, and (c) trauma leads to many cardinal features of CPs. These features include reduced inhibitions and impaired social competence that may result from the hyperarousal, trust violation, and intense negative emotions that occur following trauma (Dodge et al., 1990; Greenwald, 2002b). Widom and her colleagues examined moderating or mediating variables from childhood victimization to juvenile delinquency, such as running away (Kaufman & Widom, 1999) and problematic alcohol use (Widom et al., 2006). Some studies have also found a link between trauma and oppositional defiant disorder (ODD; Ford, Racusin, Daviss, et al., 1999) and to a comorbid PTSD diagnosis (Ford, Racusin, Ellis, et al., 2000). High rates of ODD and conduct disorder (CD) have also been found among children with a history of physical abuse (Flisher et al., 1997) and sexual abuse (Merry & Andrews, 1994; Sirles, Smith, & Kusama, 1989). In one study that specifically assessed trauma and PTSD in youth with CD, over half of the sample experienced trauma (56%), with 17% meeting criteria for PTSD (Reebye, Moretti, Wiebe, & Lessard, 2000).

Addressing Trauma in the Treatment of Youth Protection Services (YPS) Youth

Many traumatized adolescents are placed under Youth Protection Services (YPS). YPS ensures the care of youth in cases of maltreatment, when there is high risk of maltreatment and when there is problematic childhood behavior (e.g., truancy, delinquent behaviors). Youth are placed in foster homes or residential facilities when the problems cannot be addressed in their home (Tourigny et al., 2003).

In 2001, 15,946 adolescents were referred to YPS in Québec due to neglect, 4,011 due to physical abuse, 5,647 due to sexual abuse, and 423 due to parental abandon (Association des Centres Jeunesse du Québec, 2001). Studies that have compared youth placed in YPS to comparable samples have found that they have more behavioral and emotional problems (Kortenkamp & Ehrle, 2002), are less likely to pursue further education, and are less engaged and have more difficulties in school than matched or high-risk youth (Blome, 1997; Kortenkamp, & Ehrle, 2002). They were also found to use more health services than youth subsequently placed in YPS or youth whose families were receiving aid (Bilaver,

Kienberger Jaudes, Koepke, & George, 1999). Placed children who were reunified with their families were found to have more negative outcomes than children who did not reunify (Taussig, Clyman, & Landsverk, 2001). In addition, placed maltreated youth were also not found to have increased risk of delinquency compared to matched youth left at home (Desmond & Gould, 1985). Therefore, data on placed youth are either correlational or mixed, thereby leaving the effects of YPS placement on youth ambiguous.

Nevertheless, the data reveal the need for services for these youth. The services YPS offers include educative assistance; psychological, psychiatric, and substance abuse intervention; and readjustment in natural and closed settings. However, the current interventions have not been offered systematically and have been found to be insufficient and sometimes questionable as they are not necessarily empirically founded (Association des Centres Jeunesse du Québec, 2001). As such, an empirically validated treatment offered over a short time period to these adolescents that would address the trauma ensuing from childhood maltreatment would significantly contribute to this clinical field.

EMDR and MASTR Treatments

EMDR is a trauma-focused intervention that was developed by Shapiro (2001). She suggests that this approach is guided by the adaptive information processing model. It posits that traumatic memories are not properly stored like other memories, whose associations form the basis of learning. The goal of EMDR is to “forge new connections between unprocessed memory and more adaptive information that is contained in other memory networks” (Shapiro & Maxfield, 2003, p. 199). EMDR has been defined both as a comprehensive psychotherapy approach (Shapiro, 2001) and as a psychological treatment that has been extensively researched and identified as a trauma treatment of choice for PTSD (Bisson & Andrew, 2007). The EMDR method minimally entails obtaining a trauma history from the client, developing a treatment plan including choosing traumatic memories to process, choosing the order to process these memories, preparing the client for the procedure, processing the memories, providing closure, and reevaluating previous work (Shapiro, 2001).

The steps to process the traumatic memory generally consist of identifying targets of work (i.e., the traumatic memory), the most vivid image associated with each target, a negative belief and preferred positive about the self (which is rated), a related emotion (which is rated as well), and body sensations. Then the client is asked to concentrate on the worst moment of the selected trauma while moving the eyes back and forth by following the therapist’s moving fingers (other methods of alternating bilateral stimulation including taps on alternate hands are used when eye movements prove difficult for a client). Subsequently, the client is asked to report what came into awareness, such as images, thoughts, emotions, or physical sensations. The focus of the next set is determined by the client’s changing status. For example, if the client reports feelings of anger, the therapist may suggest concentrating on the anger in the next set. This procedure is repeated until the client reports no further memory-related distress. The client is then asked to focus on the traumatic memory while thinking about the previously identified positive belief (or a new one) along with alternate bilateral stimulation. This is also repeated until the client reports increased confidence in the belief. Finally, negative body sensations are also processed in the same manner, whereas positive sensations are enhanced.

EMDR therapy was selected as a trauma treatment for youth for many reasons: (a) the client is not required to disclose details of the trauma, (b) homework is not

required (Shapiro, 2001), (c) neither insight nor intelligence are required (Greenwald, 1999; Seubert, 2005), and (d) EMDR has outperformed other empirically supported trauma treatments, at least with children and youth (de Roos, Greenwald, de Jongh, & Noorthoorn, 2008; Jaberghaderi, Greenwald, Rubin, Zand, & Dolatabadi, 2004; Wanders, Serra, & de Jongh, 2008). Indeed, youth have done quite well with EMDR, with rapid reduction or elimination of trauma symptoms as reported in case reports (Cocco & Sharpe, 1993; Greenwald, 1994; Pellicer, 1993; Puffer, Greenwald, & Elrod, 1998; Tufnell, 2005) and the controlled comparison studies noted previously (Chemtob, Nakashima, & Carlson, 2002; de Roos et al., 2008; Jaberghaderi et al., 2004; Wanders et al., 2008). Several EMDR studies are of particular interest for the population in this study. In a case series, Datta and Wallace (1996) provided three EMDR sessions to 10 adolescent male institutionalized sex offenders, who showed increases in empathy and school performance at post treatment. Several participants also spontaneously initiated attempts to provide restitution to their victims. Scheck, Schaeffer, and Gillette (1998) compared two sessions of EMDR to active listening for 60 girls/young women (ages 16–24) engaged in high-risk behaviors (e.g., prostitution, substance abuse); the EMDR group was significantly better on all measures, especially at follow-up. Soberman, Greenwald, and Rule (2002) compared standard care to standard care plus three sessions of EMDR among 29 boys with CPs in residential/day treatment and found that compared to standard care, EMDR led to significantly reduced trauma symptoms and primary presenting problem behaviors. In contrast, one study did not find that EMDR improved outcomes for children and adolescents with a variety of presenting problems in a child guidance center (Rubin et al., 2001).

Despite the mostly favorable findings on EMDR with youth, it is particularly challenging to get maltreated adolescents to engage in therapy and especially trauma resolution, as they may (a) have low motivation for treatment; (b) believe that benefit is unlikely; (c) mistrust adults; and (d) have low affect tolerance, avoid emotion, and avoid the trauma memory (Greenwald, 2009). These difficulties are exacerbated by behavioral problems, which are associated with a lack of insight regarding one's problems and fears of losing one's freedom and being controlled (Sommers-Flanagan & Sommers-Flanagan, 1995). As such, a trauma-focused treatment for adolescents taken in charge by YPS should address these obstacles.

Greenwald (2009) developed a manualized comprehensive trauma-focused treatment package for use among adolescents with CPs, called MASTR. This approach aims at treating the trauma of adolescents with CPs and addresses treatment obstacles by establishing a sense of safety within therapy, encouraging clients to be the agents of their change, improving motivation, and guiding them toward progressive successes to their goals. It incorporates a sequence of empirically validated therapeutic strategies including motivational interviewing, cognitive-behavioral training, coping skills development, trauma resolution, and relapse prevention/harm reduction in a phase model treatment approach. Although the MASTR protocol does not specify which treatment should accomplish trauma resolution, EMDR was also used in the previous MASTR studies (for more details see Greenwald, 2009).

Motivational interviewing (MI) incorporates empathic listening, developing a discrepancy between desired and current behavior, avoiding argumentation, acknowledging resistance, emphasizing the power of choice, and supporting self-efficacy. Empirical evidence of MI's effectiveness is abundant for substance abusing populations (Miller, 1996) and is argued to be useful for all involuntary clients. Cognitive-behavioral training and coping skills development (e.g., increasing self-awareness, self-monitoring, and self-control) have been supported empirically in traumatized and CP populations (Cohen,

1998; Kazdin, 1997). Guided imagery techniques focusing on imagining the effective behaviors as well as the desired outcome (which are incorporated with MI in MASTR to promote desired behaviors) have also received empirical support (Taylor, Pham, Rivkin, & Armor, 1998). Finally, the evidence for EMDR has already been noted; EMDR has been used for trauma resolution, and working through trauma is seen as an integral part of trauma therapy (Cohen, 1998). MASTR incorporates client history, treatment planning, and client preparation for trauma resolution, using interventions uniquely suited to this challenging population (Greenwald, 2002a). Therefore, the standard EMDR treatment protocol that includes a three-pronged approach which specifically processes (a) the disturbing memories that set the foundation for the pathology, (b) the current situations that trigger disturbance, and (c) memory templates for appropriate future action was not entirely implemented; only the phase of treating the trauma was used.

Following positive case reports of MASTR with two incarcerated youth (Greenwald, 2000), an open trial found that all six adolescents treated with MASTR showed reduced trauma symptoms, reduced presenting problem behaviors, and improved school performance (Greenwald, 2002a). Given the difficulty in treating adolescents with CPs and the likely value of addressing their trauma-related issues, the authors believed that the potential value of MASTR and the encouraging outcomes from the open trial indicated that further study was warranted. In addition, although most EMDR research with youth is favorable, further examination is indicated with special populations such as adolescents with CPs.

Objectives

This study aimed at evaluating the effects of MASTR/EMDR among traumatized adolescents with CPs admitted to YPS. As such, this study did not strictly evaluate EMDR, but a treatment package including EMDR (and other interventions such as MI). The first hypothesis was that participants receiving 12 weeks of weekly sessions of MASTR/EMDR would present reduced trauma symptoms and behavioral problems compared with participants receiving the routine therapy administered in YPS. The second hypothesis was that these effects would be maintained at a 3-month follow-up.

Method

Participants

Data were collected between May 2005 and November 2006. Eighty adolescents admitted to YPS in Québec consented to participate in this study with a parent/legal guardian. Eleven participants changed their minds about participating after signing the consent form. Four other participants were excluded due to psychosis ($n = 2$) or lack of trauma exposure ($n = 2$) following an interview screening for trauma exposure, conduct problems, psychotic disorders, suicidality, or mental retardation. All retained participants ($n = 65$) were randomly assigned to receive 12 weeks of MASTR/EMDR therapy ($n = 33$) or routine treatment ($n = 32$). Participants were referred to YPS due to lack of parental responsibility ($n = 7$), parental rejection ($n = 5$), threatened physical health due to lack of appropriate care ($n = 1$), risk of moral/physical danger for the child due to parents' lifestyle ($n = 15$), sexual abuse ($n = 3$), physical abuse ($n = 6$), serious behavioral disturbances ($n = 32$), school absence ($n = 1$), commitment of a criminal offense ($n = 5$), or other ($n = 7$). Some participants were referred under more than one reason ($n = 15$).

Attrition at Post Treatment. Fifteen participants dropped out of the study at post treatment. In the experimental group, they dropped out for refusing to discuss their traumas ($n = 2$), for no longer being in custody of YPS and their families stopped their participation ($n = 2$), and for changing their minds ($n = 6$). Two participants dropped out following completion of MASTR/EMDR and did not carry out further assessment. In the control group, four changed their minds and one ran away. As such, 48 participants were retained with 21 in the experimental group and 27 in the control group.

Attrition at 3-Month Follow-Up. Two participants in the experimental group and six participants in the control group dropped out of the study at this point because they changed their minds about participating. Therefore, 40 participants were retained at the follow-up, with 19 participants in the experimental group and 21 in the control group. The current study compares the 40 participants who stayed in the study until its completion. Analyses of variance (ANOVAs) and chi-square tests found no significant differences between the treatment and control groups as well as between those retained in the study and those who withdrew. Analyses compared age, gender, living arrangements, types of trauma, clinical and nonclinical levels of trauma, and internalizing and externalizing symptoms. Analyses included participants retained in the study for the follow-up evaluation. As such, sample composition included 25 female and 15 male French-speaking adolescents aged from 13 to 17 years (Table 1).

Measures

One in-house questionnaire evaluated demographic information. The French versions of the measures evaluated adolescents' symptomatology. Modules of the Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) evaluated PTSD, CD, and ODD according to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association [APA], 2000). Symptoms were assessed in addition to diagnoses to account for a larger repertoire of problems. The French version of the DISC is currently being validated. The DISC has adequate reliability ($\kappa = .10$ to $.37$ for the different disorders; Shaffer et al., 2000) and acceptable validity ($\kappa = .24$ to $.57$ agreement with clinician diagnoses; Schwab-Stone et al., 1996). A higher score in the symptom count indicates more symptoms.

The Trauma Symptom Checklist for Children (TSCC; Briere, 1989, 1996) is a 54-item self-report measure used to assess trauma-related difficulties. The TSCC includes six clinical subscales measuring stress, anger, depression, dissociation, anxiety, and sexual concerns (Briere, 1996; Friedrich, Jaworski, Huxsahl, & Bengtson, 1997; Lanktree & Briere, 1995). It has adequate reliability with alphas in the mid to high 80s for all scales except for sexual concerns, which has alphas in the mid 60s (Briere, 1996; Friedrich et al., 1997; Lanktree & Briere, 1995). The validity ($r = .20$ to $.37$ with other measures, Friedrich et al., 1997; $r = -.21$ to $-.22$ with symptom reduction, Lanktree & Briere, 1995) are also satisfactory. The TSCC was also validated in French in a Quebec sample (Jouvin, 2000). A higher score on the TSCC indicates more trauma symptoms.

The parent-version of the Child Behavior Checklist (CBCL; Achenbach, 1991b) is a widely accepted 112-item measure that assesses social competence and behavioral problems. Subscales can be grouped into externalizing (i.e., aggression and delinquency) and internalizing difficulties (i.e., anxiety/depression, somatic difficulties, retreat). The CBCL has been found to have high validity ($r = -.20$ to $-.44$ on variables relating to adaptive functioning and $r = .17$ to $.44$ on measures of pathology) and reliability (mean $\alpha = .77$,

Table 1
Demographic characteristics and trauma exposure

	Experimental group <i>n</i> = 19	Control group <i>n</i> = 21
Mean age (<i>SD</i>)	14.3 (1.4) % (<i>n</i>)	14.9 (1.3) % (<i>n</i>)
<i>Gender</i>		
Male	26.3 (5)	47.6 (10)
Female	73.7 (14)	52.4 (11)
<i>Ethnicity</i>		
Canadian	100 (19)	85.7 (18)
Italian	0	4.8 (1)
Haitian	0	4.8 (1)
Indian	0	4.8 (1)
<i>Lives with</i>		
Both parents	15.8 (3)	9.5 (2)
Mother	10.5 (2)	9.5 (2)
Other family member	5.3 (1)	4.8 (1)
Youth protection center	68.5 (13)	66.8 (14)
Foster home	0	9.5 (2)
<i>Trauma exposure</i>		
Injury	57.9 (11)	66.7 (14)
Witness injury	73.7 (14)	51.9 (13)
Friend/family sick/died	94.7 (18)	95.2 (20)
Robbery	36.8 (7)	28.6 (6)
Fire	0	9.5 (2)
Natural disaster	10.5 (2)	4.8 (1)
Parental separation	63.2 (12)	81.0 (17)
Threat	73.7 (14)	52.4 (11)
Physical abuse	84.2 (16)	66.7 (14)
Sexual abuse	63.2 (12)	52.4 (11)
Mean number of trauma types (<i>SD</i>)	4.6 (1.6)	4.2 (1.4)
<i>Family income</i>	<i>n</i> = 17	<i>n</i> = 12
\$0–\$39,999	41.2 (7)	75.0 (9)
\$40,000–\$79,999	35.3 (6)	16.7 (2)
\$80,000–\$130,000	23.5 (4)	11.0 (1)
<i>Cause of YPS referral</i>		
Lack of child care	10.5 (2)	14.3 (3)
Rejection	0	14.3 (3)
Threatened health	10.5 (2)	23.8 (5)
Risk from parents' lifestyle	10.5 (2)	23.8 (5)
Sexual abuse	15.8 (3)	0
Physical abuse	5.3 (1)	9.5 (2)
Serious behavioral disturbances	47.4 (9)	33.3 (7)
School absence	5.3 (1)	0
Criminal offense	5.3 (1)	14.3 (3)
Other	15.8 (3)	19.0 (4)

Note. YPS = Youth Protective Services.

median $a = .76$) in the assessment of adolescents (Dutra, Campbell, & Westen, 2004) and to be highly correlated to observed behaviors ($r = .21$ to $.30$ on total scores; Wherry et al., 1992). The two previous months were assessed in this study. A higher score reflects greater behavioral problems.

The Lifetime Incidence of Traumatic Events (LITE; Greenwald, 2004; Greenwald & Rubin, 1999; Greenwald, Rubin, Russell, & O'Connor, 2002) is a 16-item self-report questionnaire that covers the gamut of traumatizing events and losses. The impact both at the time of the event and at the current moment is assessed on a 3-point Likert frequency scale (i.e., *none, some, lots*). Only individuals reporting at least one traumatic experience with a high impact at the time of the study were included. Preliminary support for the validity ($r = .53$ to $.56$ with the TSCC; Greenwald, Satin, Azubuike, Borgen, & Rubin, 2001) and reliability ($a = .80$; Greenwald & Rubin, 1999) has been found.

Design and Procedure

The research opportunity was brought to the participants' attention by their YPS caseworker. The participants then met the research assistants, who provided an explanation of the study and obtained their informed consent. Subsequently, an initial evaluation was conducted with the adolescents and a parent/caregiver. The primary YPS caregivers filled out the parent version of the questionnaires for youth in residence and the parents/legal guardians filled out the questionnaires in all other cases. The adolescents who met inclusion criteria were randomly assigned to MASTR/EMDR or routine care conditions (i.e., the care normally received by adolescents in YPS, recorded for the purposes of the study). The participants in the experimental group also continued to receive their routine treatment throughout the study period. Participants receiving the treatment were evaluated immediately after treatment completion and 3 months later. The participants in the wait-list condition were evaluated in the same time segments and were then offered the therapy due to ethical considerations (their treatment data are not included in the present study).

The research assistants were primarily doctoral-level clinical psychology students who received training and ongoing supervision in the administration of all measures. All MASTR/EMDR sessions followed a step-by-step written treatment protocol including scripts covering the bulk of most sessions. The sessions were videotaped and reviewed by two evaluators who assessed the treatment fidelity from randomly sampled sessions. One evaluator was a doctoral-level clinical psychology student and the other was a bachelor-level psychology student. Both were provided with training on evaluating the treatment protocol. The ethics committees at the Université de Montréal and the Centre jeunesse de Québec/Institut universitaire approved the study and informed consent was obtained from the adolescents and one of their parents or legal guardians.

Treatment

Twelve weekly individual sessions of MASTR/EMDR that lasted a maximum of 1.5 hr were offered to the adolescents. Since the original open trial (Greenwald, 2002a), the protocol had undergone considerable development (see Greenwald, 2009); in this study, the revised protocol was used (Greenwald, 2009). Sessions 1 to 4 of MASTR are composed of an evaluation in which rapport is established, history is assessed, and the client is guided to identify short- and long-term goals and visualize a positive future including constructive actions leading to a happy ending, as well as visualize the unwanted alternative, an

unhappy ending. This is followed by a case formulation and treatment planning session in which the client commits to working toward the positive goals. Sessions 5 to 8 consist of self-management skills training, including one session on avoiding high-risk situations and multiple sessions in which clients imagine using opposing behaviors on each occasion connecting the poor self-control choice with the unhappy ending and the effective self-control choice with the happy ending. Sessions 9 to 12 are devoted to trauma resolution. EMDR begins with recent minor upsetting events so that clients are introduced to EMDR under low stress, and highly traumatic events are only processed afterward. In this study, participants had been exposed to a mean 4.4 ($SD = 1.5$, range = 1–7) types of trauma and a mean of 5.6 ($SD = 2.0$) traumas were worked through in the EMDR sessions. Although the MASTR protocol may include more or less self-management sessions, does not limit trauma resolution to four sessions, and includes follow-up relapse prevention and harm reduction work, in this study only the 12 sessions were provided as described.

The manualized (procedure) portion of the EMDR protocol was conducted according to Shapiro's (2001) text, with minor age-appropriate modifications as needed such as using a visual approach to report Subjective Units of Disturbance Scale (SUDS) or using emotional faces to identify emotions (Greenwald, 1999). In each session, including the EMDR sessions, the therapists utilized forms with scripts and space for notes, to support adherence to the treatment protocol.

Two licensed master's-level therapists with 29 and 30 years of experience with youth, who had completed the full EMDR training and had ongoing supervision from MASTR's originator (who is also a credentialed EMDR instructor), provided the treatment. Thirty percent of the MASTR/EMDR sessions were viewed randomly by one doctoral-level and one bachelor-level student to assess treatment fidelity. These evaluators were provided with copies of the treatment manual, fidelity rating sheets, and a training session from one of the therapists. On average, 94% of criteria in the treatment protocol were met, suggesting that the treatment was implemented properly. Interrater reliability was assessed for 30% of the viewed sessions and was found to be 100%.

The routine care had various forms. Among participants in the control group, 57% received another form of therapy. The types of therapy received were individual (43%), dyadic (14%), group (14%), family (14%), or other types of therapy (29%). In addition to the 12 sessions of MASTR/EMDR, participants in the experimental group continued to receive individual (5%), group (21%), family (11%), and other types of therapy (16%). On average, participants in the control group received 17 sessions of their other treatments over a period of 8 months and the experimental group received 11 sessions over the same time period concurrent with the 12 sessions of MASTR/EMDR.

Data Analysis

ANOVAs and chi-square tests were conducted to determine group differences at the intake. Repeated measures analyses of covariance (ANCOVAs) with posttreatment and follow-up scores were used with the pretreatment scores included as a covariate. These were used to first assess the differences at post treatment and second whether these effects were maintained at follow-up. Effect sizes (partial eta squared) were calculated by comparing the treatment effects between the two groups and were determined according to Cohen's (1988) guidelines. As such, an effect size equal to or greater than .06 would be considered a medium effect size, and those equal to or greater than .14 would be considered a large effect.

Results

Pre–Post Treatment Differences

The first hypothesis was that MASTR/EMDR would significantly improve adolescents' symptoms and behaviors compared with routine care. As predicted, ANCOVAs confirmed that participants who received the MASTR/EMDR treatment significantly improved compared to the control group on 9 of the 11 outcome variables, with no differences observed for CD symptoms as measured by the DISC and internalizing problems as measured by the CBCL. Significant differences and medium to large effect sizes were found between the scores of the experimental and control groups at the posttreatment evaluation on (a) post-trauma difficulties as assessed by the DISC and TSCC, (b) externalizing problems as assessed by the CBCL, and (c) symptoms of disturbance disorders as assessed by the DISC. The most prominent effects were found for stress and depression with effect sizes larger than .20. Table 2 presents the means scores and the results of the ANCOVAs for both groups.

Posttreatment–Follow-up Differences

The second hypothesis that the treatment effects would be maintained at a 3-month follow-up was also confirmed. Treatment effects were maintained at the 3-month follow-up as no differences between post treatment and follow-up were found. There was, however, a significant interaction effect (Time $\times$ Group) for dissociation, $F(1, 40) = 7.83, p < .05, \eta^2 = .18$, but no significant simple effects were found (see Table 2).

Clinical Changes

The percentage of participants whose scores on the DISC, TSCC, and the CBCL passed a clinical threshold was computed at all three points of evaluation (Table 3). Fewer participants in both groups met criteria for *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; APA, 2000) diagnoses at the posttest and follow-up evaluations. However, the decline was even greater for the experimental group, which presented fewer participants with clinical scores following the treatment. In addition, no detrimental effects were found.

Adolescents' Level of Satisfaction with the Treatment

All participants were asked to rate treatment satisfaction on a 3-point scale ranging from 1 (*low*) to 3 (*high*). The mean rating for treatment satisfaction was 2.86 for the experimental group, revealing the participants' general satisfaction with the treatment as opposed to the control group who had a mean rating of 2.00.

Discussion

Analyses revealed that the study's hypotheses regarding the effects of MASTR/EMDR among traumatized youth with CPs were confirmed. This treatment led to reduced trauma symptoms and behavioral problems among participants in the experimental group and effects were maintained at follow-up. In addition, parents' and adolescents' questionnaires and statistical and clinical analyses predominantly complemented each other and thereby confirmed the validity of these findings.

Table 2
Means and standard deviations at pretreatment, post treatment, and follow-up by groups

	Experimental group (<i>n</i> = 19)			Control group (<i>n</i> = 21)			Posttreatment ^a		Follow-up ^b	
	Pre	Post	Follow-up	Pre	Post	Follow-up	<i>F</i> (<i>df</i> = 1, 40)	$\eta^2 h^2$	<i>F</i> (<i>df</i> = 1, 40)	$\eta^2 h^2$
Child measures										
DISC										
PTSD symptoms	6.4 (4.2)	.3 (1.4)	.4 (1.0)	3.7 (4.9)	1.4 (3.4)	1.3 (3.2)	6.05*	.14	.26	.01
ODD symptoms	3.7 (1.9)	1.1 (1.8)	1.1 (1.4)	3.0 (2.5)	2.2 (2.2)	1.8 (1.9)	4.68*	.12	.11	.00
CD symptoms	2.0 (2.3)	.4 (1.0)	.5 (1.1)	1.6 (2.0)	.6 (1.6)	.8 (1.9)	1.12	.03	.00	.00
TSCC										
Stress	12.0 (6.0)	3.3 (3.6)	3.8 (4.0)	11.1 (6.0)	8.1 (6.3)	6.8 (5.5)	10.16**	.22	1.69	.04
Anger	10.5 (6.4)	3.8 (3.5)	4.8 (5.4)	7.4 (5.7)	5.2 (4.4)	4.3 (3.3)	4.94*	.12	3.59	.09
Depression	10.0 (6.4)	2.2 (2.0)	3.7 (5.6)	7.6 (5.6)	5.7 (5.0)	4.7 (4.8)	14.71***	.28	3.70	.09
Dissociation	9.1 (7.2)	2.2 (2.4)	2.9 (4.2)	6.4 (3.5)	4.6 (4.1)	3.3 (3.4)	7.31*	.17	7.76*	.17
Anxiety	8.4 (5.6)	2.8 (2.6)	2.2 (2.5)	7.4 (6.1)	5.9 (5.8)	4.8 (4.3)	7.56**	.17	1.29	.03
Sexual concerns	3.8 (4.8)	1.6 (1.9)	1.5 (2.4)	4.8 (5.0)	3.8 (4.4)	2.8 (3.2)	6.73*	.15	1.05	.03
Parent measures										
CBCL										
Externalizing	70.3 (11.1)	58.9 (12.1)	57.9 (13.6)	67.8 (10.0)	68.3 (9.9)	69.5 (9.0)	9.77*	.21	.15	.00
Internalizing	67.9 (7.8)	60.6 (8.5)	61.6 (7.5)	67.6 (6.7)	66.1 (12.1)	66.4 (11.0)	3.22	.08	.15	.00

Note. DISC = Diagnostic Interview Schedule for Children; PTSD = posttraumatic stress disorder; ODD = oppositional defiant disorder; CD = conduct disorder; TSCC = Trauma Symptom Checklist for Children; CBCL = Child Behavior Checklist.

^aTreatment effect on posttreatment controlling for pretreatment.

^bInteraction of Time by Treatment Effect controlling for pretreatment.

p* < .05. *p* < .01. ****p* < .001.

Table 3
Percentages of clinical scores at pretest, posttest, and follow-up

	Experimental group (<i>n</i> = 19)			Control group (<i>n</i> = 21)		
	Pre	Post	Follow-up	Pre	Post	Follow-up
DISC						
PTSD diagnosis	36.8	0	0	19.0	9.5	4.8
ODD diagnosis	36.8	5.3	5.3	23.8	9.5	0
CD diagnosis	42.1	0	5.3	28.6	9.5	9.5
TSCC						
Stress	15.8	0	0	19.0	9.5	4.8
Anger	10.5	0	0	4.8	4.8	4.8
Depression	26.3	0	5.3	19.0	9.5	9.5
Dissociation	15.8	0	5.3	0	4.8	4.8
Anxiety	26.3	0	0	19.0	9.5	4.8
Sexual concerns	21.1	5.3	5.3	14.3	4.8	4.8
CBCL						
Externalizing	68.4	36.8	47.4	66.7	85.7	76.2
Internalizing	78.9	42.1	47.4	76.2	66.7	66.7

Note. DISC = Diagnostic Interview Schedule for Children; PTSD = posttraumatic stress disorder; ODD = oppositional defiant disorder; CD = conduct disorder; TSCC = Trauma Symptom Checklist for Children; CBCL = Child Behavior Checklist.

The results are consistent with those found in previous research supporting the use of EMDR among children and adolescents (Chemtob et al., 2002; Cocco & Sharpe, 1993; Datta & Wallace, 1996; Greenwald, 1994; Greenwald, 2002a; Jaberghaderi et al., 2004; Maxwell, 2003; Puffer et al., 1998; Scheck et al., 1998; Soberman et al., 2002). These findings also support the use of the MASTR protocol as a whole and especially with adolescents who have CPs. Participants improved significantly and clinically on trauma and behavioral difficulties. The MASTR/EMDR treatment may have led to even greater improvement but for some limiting features of the research design. The participants receiving MASTR/EMDR reported a mean number of 4.4 types of traumatic events. However, only one traumatic memory is worked through at a time in EMDR and it may take more than one session to work through a given traumatic memory. The four EMDR sessions allocated in this study was probably insufficient in many cases to process all of these participants' traumatic memories. In addition, the final phase of MASTR was not included in this study, namely consolidation of gains after posttrauma resolution, followed by relapse prevention and harm reduction, which may also improve outcome.

CD symptoms did not change significantly although other CPs such as ODD symptoms and externalizing problems did significantly improve. This may indicate that although this treatment improved general CPs, it did not sufficiently target CD. Treatments for CPs often incorporate problem-solving skills training, which was included in MASTR, yet they also include a family component. For example, parent management training (Kazdin, 2005) teaches parents to improve parent-child interactions; functional family therapy targets the relational function of the problem; and multisystemic therapy focuses on individual, family, and extrafamilial systems. During treatment, some of the parents/caregivers may not have understood what their child was going through, thereby thwarting treatment progress.

Trauma-focused treatments also advocate parent treatment. For example, Deblinger and colleagues (Cohen, Mannarino, & Deblinger, 2006; Stauffer & Deblinger, 1996) have included a parent component in their treatment for sexually abused children as parental support has been found to improve outcome while negative parental behaviors further aggravate the problems. Participants may have further benefited if their parents/caregivers were offered a parallel treatment providing support and psychoeducation. In his new book, Greenwald (2009) recommends parent training and/or other community/system interventions in conjunction with this individual protocol.

Internalizing symptoms, as found by the CBCL, did not significantly change. This seems to contradict the finding of significant improvement on trauma symptoms, as assessed by the TSCC, which includes internalizing subscales (e.g., depression, anxiety). This may be explained by the parents/caregivers' completion of the CBCL as opposed to the adolescents themselves. Internalizing symptoms may be more difficult to judge from an external perspective. In particular, adolescents who are being seen in the context of YPS may especially be averse to confiding in their caregivers. In addition, cross-informant agreement is generally quite low for youth psychopathology (Achenbach, 1991a). It is worth noting that only 2 of the initial 80 participants were screened out of the study for lack of a reported trauma. The vast majority of the sample (97.5%) therefore reported experiencing major trauma that left a strong emotional impact on them, possibly representing the trauma experienced by many youth with CPs. It would be interesting to further investigate this minority who reported no trauma history as they may have underestimated the impact of past events in order to minimize them. Moreover, the fact that most were traumatized may indicate that this treatment may be generalizable to other youths in these settings.

This study combined MASTR with EMDR rendering it impossible to discriminate between the specific effects of MASTR or of EMDR. Because the 3-pronged approach of EMDR was not implemented, no firm conclusion could be provided regarding the efficacy of EMDR. In addition, it is questionable whether these adolescents would be willing or able to go through EMDR without MASTR. However, EMDR incorporates a preparatory phase in its treatment and MASTR may be considered as an extended preparatory phase for EMDR suitable for this population. Moreover, the excellent treatment participation rates in the study (as only two participants refused treatment) may be due to the effects of the motivational work and the confidence building step-by-step approach in MASTR.

It is important to note some of the study's limitations. First, the control group was exposed to routine care, which was also offered to the experimental group. The routine care sometimes consisted of therapy and was at other times irregular in terms of content, duration, and type of therapist. Offering a more defined alternative therapy to the control group would offer a contrast to MASTR/EMDR and would control for a possible placebo effect. In addition, the higher dose of treatment received by the MASTR/EMDR group (11 routine care sessions plus 12 MASTR/EMDR sessions) in contrast to the control group (17 routine care sessions) could have accounted for the improved outcome. Second, as mentioned previously, because EMDR was combined with MASTR, it is impossible to discriminate between their specific effects. Third, due to YPS' large network of therapists not implicated in the research, the level of experience of each therapist offering routine care was unknown in this study. As such, these therapists may have had less experience than the MASTR/EMDR therapists, which may partially account for the difference in outcome. Finally, the number of placements encountered by each adolescent was not recorded, which may be a confounding variable as an increased number of placements has been found to be associated with worse problems (Newton, Litrownik, & Landsverk, 2000).

This study improved on past research with sound methodology. Participants were randomly assigned to treatment conditions, statistical and clinical indices of improvement were measured, and blind assessors were used. This study had a larger sample than previous studies, almost all eligible adolescents were included in the study improving generalization, standard measures were used, and outcome was assessed with two sources of evaluation (adolescent and parent/caregiver). Finally, a treatment setting was used, thereby increasing the study's generalizability.

In conclusion, this study implemented and demonstrated the effectiveness of MASTR/EMDR in YPS, where therapy is typically offered unsystematically or not at all. As such, it may help pave the way toward the use of more empirically validated treatments in this setting. It would be worthwhile for future research to compare the effects of MASTR/EMDR to other leading treatments for this population. MASTR/EMDR should also be tested with and without additional components such as parent training. This study filled an important gap in EMDR adolescent research and treatment outcome research in YPS and adds to research supporting EMDR with traumatized populations. Moreover, this research provides support for MASTR in engaging challenging adolescents in treatment and motivating them to work on improving their self-management skills and working through their traumatic memories. This treatment could be easily implemented in clinical settings as the therapist only needs training in EMDR and MASTR in order to use the MASTR/EMDR manual. Supervision could help ensure that the treatment is properly applied. In addition, individual treatment is possible in various clinical settings. Finally, the number of EMDR sessions offered could be tailored to the number and types of trauma experienced by the youths.

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