CHAPTER TEN

Science- and Non-Science-Based Treatments for Trauma-Related Stress Disorders

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In this chapter we critically examine widely promoted interventions for psychological trauma and its sequelae. Because the field of trauma treatment has been fertile ground for treatments with questionable claims of efficacy and effectiveness, careful scrutiny of all trauma treatments is warranted. We begin by discussing the features of psychological trauma and its prevalence. We next describe the two major diagnostic disorders that are reactions to traumatic events: posttraumatic stress disorder (PTSD) and acute stress disorder (ASD). We then address the nature of treatment efficacy research on trauma and its relation to treatment effectiveness. In doing so, we outline contemporary cognitive-behavioral theories of anxiety disorders and describe empirically supported psychosocial treatments for those conditions. We next discuss promising psychosocial procedures for pre-event and postevent prevention of the disorders. Finally, we discuss the professional and social implications of the implementation of science-based interventions for trauma.

TRAUMA AND ITS CONSEQUENCES

The most frequent traumas are the violent death of a loved one, robbery, physical or sexual assault, motor vehicle accident, or natural disaster...
(Breslau et al., 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Epidemiological evidence indicates that between 50 and 70% of adults have experienced at least one such event in their lifetime (Kessler et al., 1995). The bulk of treatment efficacy research to be reviewed has been predicated on the formal diagnosis of PTSD first identified in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III, DSM-III-R; American Psychiatric Association, 1980, 1987) and a subsequent revision that included ASD (DSM-IV; American Psychiatric Association, 1994). In the context of PTSD and ASD diagnoses, trauma has been defined as (1) experiencing, observing, or confronting an event that has involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others; and (2) where the person has responded with intense fear, helplessness, or horror (American Psychiatric Association, 1994).

One potential consequence of traumatic experience is PTSD, which in DSM-IV (American Psychiatric Association, 1994) consists of the following core symptoms:

1. Mentally reexperiencing the traumatic event. Such symptoms include recurrent and intrusive distressing recollections of the event, recurrent distressing dreams of the event, acting or feeling as if the event were happening again, or psychological or physiological distress when exposed to stimuli that remind the person of the traumatic event.

2. Avoidance of stimuli associated with the trauma, or numbing of general responsiveness. Symptoms in this category include efforts to avoid thoughts, feelings, or conversations associated with the trauma; efforts to avoid activities, places, or people that arouse recollections of the trauma; inability to recall an important aspect of the trauma; diminished interest in usual activities; feelings of detachment from others; restricted range of affect; and sense of a foreshortened future.

3. Increased arousal. Symptoms include sleep disturbance, irritability or anger outbursts, difficulty in concentration, hypervigilance, and exaggerated startle response. In addition, the formal diagnosis requires that the symptoms must last at least one month and cause significant distress or functional impairment.

The fifth edition of the DSM (DSM-5; American Psychiatric Association, 2013) includes a number of modifications in the diagnosis of PTSD. In addition to the domains already described, a fourth domain involving negative alterations in cognition and mood is required. Several other specific details have also been altered. First, the requirement that a person experience intense emotion at the time of the trauma has been removed. Second, the criteria for trauma are more narrow and specific, such that mere

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media exposure is no longer considered traumatic. Third, either avoidance symptoms or numbing symptoms are required as they appear to be distinct phenomena (Asmundson, Stapleton, & Taylor, 2004). Fourth and finally, symptoms involving concentration, sleep disturbance, and diminished pleasurable interest must begin after the trauma.

In DSM-5 (American Psychiatric Association, 2013), ASD symptoms include dissociative experiences during or following the event, reexperiencing symptoms, avoidance symptoms, and arousal symptoms. The symptoms are experienced during the event or immediately thereafter, last for at least 2 days or resolve within 4 weeks of the event; if they do not, the diagnosis is changed to another disorder (e.g., PTSD, major depressive disorder). In DSM-5, the onset is 3 to 31 days posttrauma. Dissociation is no longer a required symptom, but two dissociative symptoms are included. The number of symptoms has increased from 8 to 14, and 8 of those 14 are required for diagnosis. The symptoms are now more similar in content to PTSD (Kring, Johnson, Davison, & Neale, 2012).

Contemporary studies of the general population indicate a lifetime prevalence for PTSD ranging from 6.8% (Kessler et al., 2005) to 7.8% (Kessler et al., 1995). The conditional risk of developing PTSD following a trauma varies greatly, depending on the nature of the event. For males, having engaged in combat and witnessing violence are most likely to lead to PTSD. For females, rape and sexual molestation are most likely to lead to PTSD (Kessler et al., 1995). The prevalence of ASD depends on the degree of exposure, the persistence of the exposure, and the severity of the event (American Psychiatric Association, 1994, 2013).

**SCIENCE-BASED TREATMENTS COMPARED WITH “EVIDENCE-BASED” TREATMENTS**

**Comparisons**

The phrase “science-based treatments” comports much more directly with experimental methods than does the phrase “evidence-based treatment” because the contemporary definition of evidence in clinical psychology is typically broader and more diffuse, encompassing not merely research support but also clinical expertise and client preferences and values. The former phrase was coined in the context of the attempt by the American Psychological Association’s Division 12 (Society for Clinical Psychology) to develop criteria for identifying empirically supported treatments (Task Force on Promotion and Dissemination of Psychological Procedures, 1995). The result was a “box-score” approach to scientific legitimacy (Herbert, 2000, 2003) that led to a decade of professional debates regarding list qualifications, list status, training implications, and reimbursement concerns. Tasked with addressing such issues, the American Psychological Association Presidential Task Force on Evidence-Based Practice (American
Psychological Association, 2006) issued a document that codified the nature of “evidence” for evaluating treatment efficacy, effectiveness, and justification for clinical application. In response, Stuart and Lilienfeld (2007) argued that the conceptualization of “evidence-based practice” arrived at by the Presidential Task Force was largely devoid of an empirical foundation and broadened the domain of “evidence” to include virtually any and all forms of clinical opinion. Thus, we are left with the need to better specify the nature of the empirical evidence for treatment efficacy and the theories from which those treatments derive.

The theory of a treatment should also be considered when making judgments about the validity of a particular treatment (David & Montgomery, 2011; Lilienfeld, 2011). Specifically, a more direct consideration of how the relationship of the mechanisms of treatment relate to the mechanisms of the disorder being treated is needed. In the best of all scientific worlds, there should be a correspondence between the mechanisms of treatment (the active treatment ingredients) and the maintenance mechanisms of the disorder (the treatment targets). Ideally, methods to ascertain a treatment’s efficacy and effectiveness should compare treatments with credible non-specific control conditions to ascertain the additive effect of the specific content over, if any, and above therapeutic alliance and other common factors. However, strong tests of the incidental and specific content of any prescriptive, structured (or manualized) treatment should be the goal of the evaluative framework for clinical efficacy. This goal can be accomplished using component-control experimental designs (often called “dismantling designs”) to test whether the specific content of the treatment functions as the “active ingredient” responsible for apparent efficacy (Borkovec & Castonguay, 1998; Kazdin, 2002). Treatments can be considered “specific” if such experiments reveal that the necessary and specific components provide a meaningful increment in efficacy beyond incidental aspects of treatment. Such methodological concerns apply most directly to novel or recently introduced treatments that are promoted as distinct, specific, innovative, and efficacious.

Appeal to “evidence” by proponents of these treatments will be helpful only if the methodological rigor of outcome experiments undergirds that evidence. The experimental rigor of outcome studies will be maximized when the theoretical mechanisms of the treatments are submitted to strong evidentiary tests, as we have outlined. The strength of the evidence will be maximized further if the theoretical mechanisms of the disorder inform the theoretical mechanisms of the treatments. Only when we have experimental evidence that the specific content of a treatment results in change of the specific features of a disorder can we claim, in our view, to have developed empirically supported psychosocial interventions for psychological disorders. In this respect, our position differs from that of the Division 12 committee that outlined criteria for empirically supported interventions that focus exclusively on the question of how well the treatment works. In doing so, we will also be in a better position to identify treatments that...
are actively harmful or are inert. Such analyses also may have the salutary effect of focusing our evaluative efforts on evidence-based principles of psychosocial intervention rather than on named interventions (see Rosen & Davison, 2003).

Clinical Science: Demonstration of Efficacy and Effectiveness

Elucidation of active treatment components is achieved through the experimental analysis of treatment efficacy. In this analysis, (1) a treatment’s efficacy is tested against a logical progression of comparison groups, and (2) the treatment package is broken down into its constituent components that are independently tested to determine which, if any, are therapeutically active (Borkovec & Castonguay, 1998; Lohr, DeMaio, & McGlynn, 2003; Lohr, Olatunji, Parker, & DeMaio, 2005). The strength of the evidence for treatment efficacy increases monotonically when evaluated against the following comparison conditions: wait-list control, attention control, nonspecific factor control, alternative credible treatment, and working alliance (Wampold, 2001). This progressive dismantling strategy demonstrates that the procedure contains an active ingredient that adds incremental efficacy to the treatment beyond that attributable to nonspecific factors (Lohr et al., 2003, 2005). Treatment effectiveness first presumes treatment efficacy (see Gaudiano, Dalrymple, Weinstock, & Lohr, Chapter 6, this volume). Once efficacy has been demonstrated, evaluating effectiveness includes assessing the generality of the treatment’s clinical application, feasibility of implementation, cost-effectiveness, and clinical impact.

The gap between mental health practice and the science that provides the evidential warrant for interventions has grown and may be accelerating in some quarters (Lilienfeld, Lynn, & Lohr, Chapter 1, this volume). The manifestations of this widening disjunction are most obvious in the public domain, where clinical services are often promoted with little scientific justification (Gambrill, 2012). The introduction of certain treatments claimed by proponents to be both novel and extraordinary has often been based on little more than personal testimony and vivid case studies (Herbert et al., 2000; Kalal, 1999; Lohr, 2001).

TRAUMA TREATMENT AS OBJECT LESSON

Pseudoscientific Treatment

The field of “traumatology” has rapidly expanded since PTSD was first introduced in DSM-III as an anxiety disorder often resulting from armed combat (American Psychiatric Association, 1980). The rapid expansion of the traumatology field has occurred because of the pain and suffering that often follow trauma, the apparent refractory nature of PTSD, and the often compensable consequences of the diagnosis.

In the domain of mental health practice, pseudoscience is typically
marked by confirmation bias and inattention to disconfirming data (Herbert et al., 2000). In the place of empirical evidence, pseudoscientific practice often reverts to personal testimony and anecdotal evidence (Gaudiano & Herbert, 2000). Another characteristic of clinical pseudoscience is the failure to acknowledge boundary conditions of theory and limitations of application. Treatments that are based on science and theory typically are directed at specific problems. In contrast, treatments that are based on pseudoscience are often promoted as panaceas with no limits and are said to be applicable to the widest range of clinical problems (Hines, 2003). Pseudoscience is also commonly characterized by an overpromotion of interventions to the general public relative to the available scientific evidence. Trauma treatments based on pseudoscience are often popularized in print and broadcast media long before they are subjected to controlled tests (Gaudiano & Herbert, 2000; Herbert et al., 2000).

The proliferation of pseudoscience in the mental health professions may be attributable to the resistance of many mental health practitioners to explicitly establishing scientific criteria for treatment efficacy (e.g., Fox, 2000). This reluctance appears to stem from four fundamental concerns: (1) the health care system would be faced with the responsibility of ensuring that treatments meet those criteria; (2) scientifically explicit criteria would reduce the flexibility by which treatments are provided and would likely delay the entry of new treatments into the profession; (3) scientifically explicit criteria would force many clinicians to forgo favored treatments for which research evidence is lacking; and (4) many clinicians would incur a professional obligation to be (re)trained in empirically supported treatments (ESTs); (Beutler, 2000; Nathan, 2000). The implementation of scientific criteria for evaluating treatments will surely not be without its difficulties (e.g., Herbert, 2000, 2003). However, the continued tolerance of pseudoscience in trauma-related mental health practice places the public at risk and may violate the public's trust in the profession (Bayerstein, 2001; Devilly & Lohr, 2008; Newbold, Lohr, & Gist, 2008).

Promotion of pseudoscience may also be accompanied by promotions of "junk science." Junk science comes in three major forms. One occurs in the context of legal proceedings, entering as unsubstantiated "expert" testimony by psychologists and other mental health professionals in the context of litigation (Huber, 1991; Park, 2000; see McCann, Lynn, Lilienfeld, Shindler, & Hammond, Chapter 4, this volume). Such testimony addresses psychological phenomena or services for which scientific evidence does not meet legal standards (e.g., federal rules of evidence), as in the Frye test or the Daubert standard (see Chapter 4, this volume). The second kind of junk science is sometimes found in the media, where mental health issues are commercialized through entertainment, advertising, and psychological advice-giving (Wilson, 2003). The third form of junk science occurs in the promotion of services to consumers and other parties (e.g., governmental agencies) with a stake in the efficacy of such services. In each of these contexts, junk science is manifested by opinion posing as empirical evidence,
or through evidence of questionable warrant, based on inadequate scientific methodology (Devilly & Lohr, 2008; Newbold et al., 2008). The following sections feature examples of such questionable practices in the development of the field of traumatology since the introduction of trauma-related diagnoses (American Psychiatric Association, 1980, 1987, 1994, 2013).

Eye Movement Desensitization and Reprocessing
Treatment Description and Rationale

A treatment developed by Francine Shapiro (1989) known as eye movement desensitization and reprocessing (EMDR) has become remarkably popular in recent decades. The idea of EMDR was born during a serendipitous walk in the woods in 1987 (Shapiro, 1995a). While thinking of an anxiety-provoking situation, Shapiro noticed that her eyes were involuntarily moving back and forth, and that her distressing thoughts subsequently disappeared. After a series of successful trials in her private practice and an uncontrolled study demonstrating the effectiveness of a single session of eye movements with 22 clients distressed by traumatic memories (Shapiro, 1989), Shapiro began training clinicians in her approach. Since 1992, more than 70,000 clinicians have received training in EMDR by attending proprietary certification workshops conducted by Shapiro’s EMDR Institute (Shapiro, 2005). The EMDR International Association (EMDRIA) holds numerous training and research conferences and promotes EMDR within the mental health field. EMDR has been widely advertised to the public, mental health consumers, and therapists using a variety of debatable, yet apparently effective, marketing tactics (Herbert et al., 2000). As a result, EMDR has enjoyed rapid and widespread enthusiasm among practitioners. To illustrate, the number of entrants in the EMDRIA’s therapist directory dwarfs the membership of therapist directories associated with other anxiety- and PTSD-related specialist organizations, including the Anxiety Disorders Association of America, the Association of Behavioral and Cognitive Therapies, and the International Society for Traumatic Stress Studies. As described further in this section, EMDR is distinctive among evidence-based PTSD treatments by virtue of its novel theoretical model and treatment procedures as well as its embodiment of numerous features of pseudoscience as discussed in Lilienfeld, Lynn, and Lohr, Chapter 1, this volume.

EMDR uses a structured, prescriptive intervention procedure that incorporates such general clinical components as history taking and verbal report of the nature and emotional consequences of the traumatic experience. In addition, the EMDR procedure requires the client to construct and maintain both an imaginal representation or a memory (or other image) and the physical sensations associated with the traumatic event. While maintaining the image, the therapist introduces one or more “bilateral stimulation” procedures, such as moving a finger across the client’s visual field to produce side-to-side eye movements. Such procedures are intended
to elicit simultaneous “dual attention” to internal and external stimuli. The client is asked to express the negative cognitions that accompany the affective distress and to generate a more positive appraisal about the trauma and his or her experience with it. This component is referred to as “reprocessing” and is added to the desensitization that accompanies the imaginal exposure (Shapiro, 2001).

EMDR is based on a set of theoretical conjectures that rely heavily on physiological concepts related closely to neurological processes. The nature of trauma pathology and its effective treatment is predicated on a model called accelerated information processing (AIP), which is ostensibly akin to a psychological immune system (Shapiro, 1995a). Healing is posited to occur after eye movements and other features of the clinical protocol presumably “unlock” the pathological condition. The AIP model defines pathology as “dysfunctionally stored information that can be properly assimilated through a dynamically activated processing system” (Shapiro, 1995a, p. 52). Based on this formulation, the practice of EMDR involves:

accessing the dysfunctionally stored information, stimulating the innate processing system through the standardized protocols and procedures (including the bilateral stimulation), and facilitating dynamic linkages to adaptive memory networks, thereby allowing the characteristics of the memory to change as it transmutes to an adaptive resolution. (Solomon & Shapiro, 2008, p. 316)

Despite the superficial appeal of this neurophysiological speculation, the AIP model has little scientific basis and relies heavily on obscurantist language to create the appearance of scientific legitimacy. Keane (1998) highlighted the absence of connectivity between the theoretical foundations of EMDR and scientific knowledge on the nature and treatment of PTSD (see Stanovitch, 2012). Specifically, the AIP model and bilateral stimulation techniques are largely divorced from existing models of psychopathology and psychotherapy, and are largely inconsistent with the body of scientific knowledge gleaned from experimental psychopathology regarding the nature, acquisition, and modification of fear and anxiety.

Comparison with Other Evidence-Based Psychological Treatments

Early reviews of the EMDR outcome literature (Cahill, Carrigan, & Frueh, 1999; DeBell & Jones, 1997; Herbert et al., 2000; Lohr, Lilienfeld, Tolin, & Herbert, 1999; Lohr, Tolin, & Lilienfeld, 1998) questioned the efficacy of this therapy in light of methodological limitations in studies that purported to show clinical effects. The evidence base for EMDR has increased in quantity and quality since the first edition of this book (Lilienfeld, Lynn, & Lohr, 2003), and this therapy is now regarded as efficacious in the treatment of PTSD in several clinical practice guidelines (American Psychiatric Association, 2004; Australian Centre for Posttraumatic Mental Health,
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2007; Department of Veterans Affairs/Department of Defense, 2010; National Institute for Clinical Excellence, 2005).

Two well-conducted clinical trials have directly compared the efficacy of EMDR and prolonged exposure (PE), which is a widely researched, empirically supported treatment for PTSD (Foa, Gillihan, & Bryant, 2013; Taylor et al. (2003) randomly assigned 60 participants with PTSD to receive eight 90-minute sessions of EMDR, exposure therapy (both imaginal and in vivo), or relaxation training. Self-report and blind assessor ratings of PTSD symptoms were gathered at pretreatment, 1-month posttreatment, and 3-month follow-up. Treatment conditions did not differ significantly with respect to attrition and credibility, and fidelity to the protocol was high for each intervention. Findings indicated that all three treatments were effective in reducing PTSD symptoms, guilt, anger, and depression at posttreatment and follow-up. Compared with EMDR, exposure therapy yielded a significantly higher percentage of participants with clinically significant change and greater reductions in avoidance and reexperiencing symptoms. EMDR and relaxation did not differ significantly in the magnitude or speed of improvement in PTSD symptoms.

A second methodologically rigorous study by Rothbaum, Astin, and Marsteller (2005) compared the efficacy of EMDR, PE, and a wait-list control condition in a sample of 74 adult female rape victims with PTSD. Participants assigned to active treatment received nine twice-weekly sessions of EMDR or PE. Twenty participants completed each treatment; attrition was low and did not differ significantly between conditions. Blind assessments were conducted at pretreatment, posttreatment, and 6-month follow-up. Both active treatments produced significantly greater improvement in self-reported and clinician-rated PTSD symptoms at posttreatment than did the wait-list condition and did not differ significantly from each other. At posttreatment, the percentages of patients who continued to meet the criteria for PTSD were 5%, 25%, and 90% for PE, EMDR, and wait list, respectively. Significantly more patients who received PE demonstrated good end-state functioning (78%) than those who received EMDR (35.3%) at 6-month follow-up. However, interpretation of this finding is complicated by the fact that the EMDR group evidenced higher scores on several psychopathology measures at baseline.

Several additional clinical trials have compared the efficacy of EMDR and trauma-focused CBT. Power, McGoldrick, Brown, Buchanan, Sharp, et al. (2002) randomly assigned 105 Scottish clients with PTSD to receive a maximum of 10 sessions of EMDR or exposure plus cognitive restructuring (E+C-R) in a primary care setting. A wait-list control condition was also employed. Blind raters assessed efficacy at the end of the 10-week treatment period, and the Clinician Administered PTSD Scale (CAPS) was administered at 15-month follow-up by therapists who were not blind to treatment condition. Both active treatments improved significantly more than did the wait-list condition on PTSD measures and did not differ significantly from each other. Dropout rates were comparable across conditions, and
clinically significant change was achieved by 60% of EMDR participants and 50% of E+CR participants.

Lee, Gavriel, Drummond, Richards, and Greenwald (2002) randomly assigned 24 patients with PTSD to receive seven sessions of EMDR or stress inoculation training with PE (SIT+PE), the latter of which consisted of prolonged imaginal exposure, combined with arousal-reduction techniques and cognitive coping skills. There were no significant differences at post-treatment on self- and observer-rated indices of PTSD and related symptoms, and 83% of EMDR participants and 75% of SIT+PE participants no longer met diagnostic criteria for PTSD. At 3-month follow-up, EMDR was associated with significantly greater improvement on all measures, and clinically significant improvement was evident among 92% of clients who received EMDR and 50% of clients who received SIT+PE.

The aforementioned clinical trials, as well as additional studies using less methodologically rigorous designs (e.g., Devilly & Spence, 1999; Ironson, Freund, Strauss, & Williams, 2002; Tarrier et al., 1999a; Tarrier, Sommerfield, Pilgrim, & Humphreys, 1999b), suggest that the efficacy of EMDR is generally comparable to that of trauma-focused CBT approaches such as PE in the treatment of PTSD (see Spates, Koch, Cusack, Pagoto, & Waller, 2009, for a review). This conclusion has been reached by the authors of multiple meta-analytic reviews published in recent years (Bisson & Andrew, 2007; Bisson et al., 2007; Bradley, Green, Russ, Dutra, & Westen, 2005; Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010; Seidler & Wagner, 2006). Although head-to-head comparisons with alternative therapies have demonstrated that EMDR is efficacious in the treatment of PTSD, evidence supporting the overall therapeutic benefit of this multifaceted therapy is insufficient to demonstrate the validity of the treatment’s theoretical rationale. Given the centrality of dual attention procedures in the EMDR protocol (Shapiro, 2001), as well as the novelty and scientifically questionable status of the AIP model (Devilly, 2002), it is important to consider findings from clinical studies examining the incremental contribution of bilateral stimulation techniques to the efficacy of EMDR.

EMDR Component Controls

Although EMDR involves a variety of therapeutic procedures, bilateral stimulation techniques are the distinctive and characteristic feature of this treatment and are emphasized in the theoretical conjectures underlying EMDR’s purported benefits (Solomon & Shapiro, 2008). Component-control experiments are useful in determining the extent to which the putative active therapeutic ingredients in EMDR are specifically efficacious and provide a meaningful benefit beyond the nonspecific aspects of treatment. Nonspecific factors in an experimental treatment procedure include the incidental effects of treatment, such as measurement reactivity, regression to the mean, credibility, expectation for improvement, experimental demand,
therapist–experimenter enthusiasm, and therapist–experimenter allegiance. The most important experimental controls for rigorous tests of treatment components rely on additive and subtractive experimental designs (Cahill et al., 1999; Mahoney, 1978; Nezu, 1986; Nezu & Perri, 1989). These “dismantling” designs, discussed earlier, are necessary to identify the components that are specific to EMDR, and to provide a stringent test of the incremental contribution of eye movements and related techniques to the treatment of PTSD.

Renfrey and Spates (1994) recruited 23 trauma victims, 21 of whom met diagnostic criteria for PTSD. Participants were randomly assigned to one of three conditions: standard EMDR; an EMDR analogue in which eye movements were induced by an optical device alternating the position of a light in the right and left peripheral visual field; and an EMDR analogue in which a light blinked in the center of the visual field. Dependent variables included subjective ratings of discomfort, changes in heart rate, and standardized measures of PTSD symptoms. After treatment, 5 of the 23 participants met criteria for PTSD and were roughly evenly distributed across treatment groups. Analyses of heart rate and subjective ratings revealed significant main effects for repeated assessment but no interaction between assessment and treatment condition. Analyses of the standardized measures were not reported. Thus, it appears that the general EMDR procedure, rather than saccadic eye movements per se, was responsible for reductions in self-report indices and heart rate. However, the control conditions did not directly control for measurement reactivity or nonspecific treatment factors.

Boudewyns and Hyer (1996) compared EMDR with an eye constant (EC) imagery analogue (EC) and a no-imagery control (C) procedure in the treatment of combat-related PTSD. All participants received eight sessions of the standard inpatient or outpatient treatment program at a Veterans Administration hospital. Participants in the EMDR and EC groups received between five and eight sessions of EMDR. The EC participants did not engage in eye movements during individual treatment but kept their eyes closed and engaged in imaginal exposure for the same period of time. Participants in the C condition received only the standard group treatment. The analyses revealed that the EMDR and EC conditions showed greater improvement than did the C condition on subjective distress ratings, Profile of Mood States Anxiety scores, and heart rate. The EMDR and EC conditions did not differ significantly from each other. In addition, the three groups demonstrated statistically equivalent change on the CAPS and Impact of Event Scale. Thus, neither eye movements nor any lateral stimulation was necessary for change, suggesting that imagery exposure may be sufficient for change on some indices of PTSD.

Pitman et al. (1996) used a crossover design in which combat-related PTSD clients were randomly assigned to one of two treatment sequences using EMDR or a no-movement imagery analogue (fixed-eye) treatment.
The analogue control procedure consisted of all EMDR components, including movement of the therapist's hand. The participant maintained eye fixation and tapped one finger to correspond to therapist hand movement. Each treatment was applied for a maximum of six sessions once per week. Analyses of variance between treatment conditions revealed no significant differences on psychophysiological measures. On PTSD-related outcome variables, there was limited change (only three of eight measures) within each of the procedures. Use of the control procedure suggests that eye movements confer no clear advantage over other forms of stimulation. Macklin et al. (2000) later reported that all of the participants exposed to EMDR had returned to pretreatment levels of PTSD symptoms 5 years after completion of treatment.

Devilly, Spence, and Rapee (1998) compared EMDR with a no-movement imagery analogue condition that was presented to war veterans with PTSD as “reactive eye dilation desensitization and reprocessing.” This procedure involved the full EMDR protocol except that a flashing light was substituted for lateral eye movements. Both treatments were compared with a no treatment control condition that included the same assessment battery as the treatment conditions. Treatment outcome measures included standardized anxiety, depression, and PTSD scales, as well as heart rate and blood pressure. The results showed that both treatment groups improved by posttreatment, but that there was no significant difference between conditions. Participants in the two treatment conditions did not differ significantly on standardized measures from the control condition, but improved more than the control condition when the reliable change index on the Mississippi-PTSD scale was examined. Nevertheless, there was no statistical or clinical difference in symptoms from pretreatment to 6-month follow-up. The authors concluded that eye movements are not the agent of change and that other nonspecific factors are responsible for the high levels of efficacy reported in previous EMDR research conducted without adequate procedural controls.

A number of additional studies have used dismantling designs to examine the incremental validity of eye movements in analogue samples or non-PTSD clinical populations (e.g., Cusack & Spates, 1999; Wilson, Silver, Covit, & Foster, 1996). Devilly (2002) reported that of the 13 published dismantling studies, 11 found no significant benefit to eye movements in EMDR, and the two seemingly positive studies suffered from serious methodological flaws. Although Shapiro (1989) initially claimed that eye movements were necessary for EMDR’s efficacy, she subsequently broadened the range of acceptable bilateral stimulation stimuli to include tapping, tactile stimulation, and auditory tones (Shapiro, 1996). This modification further blurred the question of the purported mechanism of action of bilateral stimulation techniques which initially relied on the similarity between EMDR eye movements and those of REM sleep (Shapiro, 1989). To date, EMDR proponents have not specified the neurophysiological mechanisms...
that make auditory and tactile bilateral stimulation techniques functionally equivalent to saccadic eye movements in activating the putative curative phenomenon of accelerated information processing. Devilly (2002) observed that by abandoning her claim that eye movements were necessary, Shapiro (1996), in effect, discounted the research investigating the role of eye movements in EMDR by rendering negative component control studies unable to falsify the AIP model.

Numerous analogue studies have examined the effects of bilateral stimulation procedures on psychological and physiological variables. Van den Hout and Englehard (2012) reviewed this experimental research in an article titled “How Does EMDR Work?” The typical study they reviewed investigated the effects of briefly recalling an unpleasant memory, versus recall plus eye movements, in healthy volunteers. The authors argued that eye movements (but not bilateral auditory stimuli) reduce the vividness and emotionality of memories by taxing working memory during recall. This notion contradicts the popular “interhemispheric communication” theory of dual stimulation techniques (Solomon & Shapiro, 2008) by regarding eye movements as a distraction that interferes with the ability to retrieve a memory. Although van den Hout and Englehard claimed that the efficacy of EMDR is attributable to the effects of eye movements on working memory, a more cautious interpretation is warranted. Findings from analogue studies employing brief exposure to unpleasant memories in healthy volunteers are of questionable generalizability to the longer-term treatment of individuals diagnosed with PTSD. Reductions in emotionality and vividness of unpleasant memories elicited by eye movements might temporarily reduce distress in a healthy volunteer, but inhibit longer-term emotional processing and fear in a patient with PTSD. Such a distraction hypothesis has been previously forwarded (Devilly, 2001a) and explicated (Devilly, 2001b) in the case of EMDR. This perspective argues that poorer long-term reductions have been noted, and would be expected, in those with clinical status through an impaired extinction of the fear response. However, within a nonclinical population there is no substantive reason to expect distraction to exert long-term clinical effects.

Of greater importance, however, is that the effects of eye movements are of little clinical relevance in the absence of compelling evidence to support the specific efficacy of bilateral stimulation techniques. These conclusions were reached by Davidson and Parker (2001) in a meta-analysis of 13 component-controlled efficacy studies. They found an effect size not different from zero when comparing standard EMDR without bilateral stimulation. A subsequent analysis of 15 component-controlled studies by Lee and Cuipers (2013) reported a statistically significant effect size of 0.27. They incorporated all visual modalities in their component controls, including therapist-driven bilateral eye movements, concatenate eye movements, negative imagery, and autobiographical memories containing distress to their inclusion criteria. The reported effect size implies that all studies revealed
the same effect, when in fact five studies showed an effect size not different from, or less than, zero (Carrigan & Levis, 1999; Foley & Spates, 1995; Lytle, Hazlett-Stevens, & Borkovec, 2002; Renfrey & Spates, 1994; Sanderson & Carpenter, 1992).

Moreover, several statistical procedures in this meta-analysis are questionable. The analysis used the number of participants, rather than the number of studies analyzed, as the sample size. Such a procedure excessively constricts confidence intervals (Sanchez-Meca & Marin-Martinez, 2008). Although the authors claim that this tactic results in producing only minor differences in outcome, the substantive analytical problem is that the error margin for statistical significance in this meta-analysis is exceptionally narrow. Further, combining effect sizes from multiple domains within one study and the comprehensive meta-analysis software used by these authors decreases the standard error and inflates the effect sizes.

Another concern was the selection of dependent variables. Meta-analyses usually combine dependent variables that possess concurrent validity from one domain. In addition, they do not combine process variables such as in-session subjective units of distress (SUDs) and validity of cognitions (VOC) variables with outcome variables that assess the diagnostic features of psychopathology. The combination of these dependent variables within each study is likely to decrease the standard error surrounding the derived effect size, as the sample size is counted for each dependent variable independently. The combination of these variables also results in the assessment of nonspecific treatment outcomes. Accordingly, we found that when the authors removed SUDs and other process variables from the meta-analysis they found the lower 95% confidence interval of the analysis only .07 above an effect size of zero, which calls into question the robustness of their claims.

Finally, the studies included appeared to lack consistency in the independent variable (eye movements) being tested. Both meta-analyses (Davidson & Parker, 2001; Lee & Cuipers, 2013) included 10 component-controlled studies (Boudewyns, Stwertka, Hyer, Albrecht, & Sperr, 1993; Carrigan & Levis, 1999; Devilly et al., 1998; Dunn, Schwartz, Hatfield, & Wiegele, 1996; Feske & Goldstein, 1997; Foley & Spates, 1995; Gosselin & Mathews, 1995; Renfrey & Spates, 1994; Sanderson & Carpenter, 1992; Wilson et al., 1996). Lee and Cuipers added three studies published after Davidson and Parker’s (2001) review (Lee & Drummond, 2008; Lytle et al., 2002; Schubert, Lee, & Drummond, 2011). However, they also included Shapiro (1989), even though that study did not include a component-control design. Shapiro (1989) noted that the control condition “provided a modified flooding procedure” (p. 206). Lee and Cuipers exclude three of the studies included by Davidson and Parker (Merckelbach, Hogervorst, Kampman, de Jong, 1994; Pitman, Orr, Altman, & Longpre, 1996; Tallis & Smith, 1994). In addition, they did not include two studies that employed imaginal exposure and experimentally manipulated...
eye movements (Devilly & Spence, 1999; Taylor et al., 2003). Moreover, they included Lee and Drummond (2008)'s results twice in the meta-analysis. A more convincing meta-analysis would have included the 10 studies analyzed by both Davidson and Parker and by Lee and Cuipers, as well as other bona fide component-control design studies published before or after Davidson and Parker (Devilly & Spence, 1999; Lee & Drummond, 2008; Lytle et al., 2002; Merckelbach et al., 1994; Pritman et al., 1986; Schubert et al., 2011; Tallis & Smith, 1994; Taylor et al., 2003), and excluded the study by Shapiro (1989).

Because of these meta-analytic discrepancies, the finding of even a small effect size for eye movements is questionable. Beyond these methodological concerns, clinical judgments of treatment content made on the basis of meta-analytic findings can be widely discrepant from those findings of well-controlled and adequately powered randomized controlled trials (RCTs) (Klein, 2000; LeLorier, Gregoire, Benhaddad, LaPierre, & Derderian, 1997). The discrepancy among the meta-analyses should be considered in light of an early commentary by Kazrin, Durac, and Agteros (1979) on the misuses of meta-analysis. They described a statistical process that they called meta-meta-analysis, stating “the strength of meta-meta-analysis, like the unfortunate person stranded on a desert island, is that it will look at anything” (p. 397). Kazrin et al. whimsically argued how this process, directed at psychotherapy efficacy, could use 50,000 therapists and 2,000,000 research participants and yet fail to reach interpretable conclusions. We believe that such tongue-in-cheek warnings regarding the misuse of meta-analysis should be taken seriously. Indeed, Barlow (2010b) has observed that, when conducting meta-analysis, “it is easy to sit back and ‘pick-off’ any new study and conclude that it is not ‘perfect’” (p. 16).

There exists a clear scientific consensus that bilateral stimulation procedures do not contribute to the efficacy of EMDR (Spates et al., 2009). The American Psychiatric Association’s (2004) PTSD guideline states that dismantling studies “show no incremental effect from the use of eye movement or other proxies during the treatment sessions” (p. 59) and “these studies call into question EMDR’s theoretical rationale” (p. 59). Clinical practice guidelines from the Department of Veterans Affairs/Department of Defense (2010) assert that “the data do not suggest that eye movements or other forms of kinesthetic stimulation are necessary” (p. 130).

The responses of some EMDR proponents to criticisms of the specific efficacy of bilateral stimulation techniques illustrate several features of pseudoscience described in Lilienfeld, Lynn, and Lohr, Chapter 1, this volume. Principal among these features is the overuse of ad hoc explanations designed to immunize claims of falsification. As detailed by Herbert et al. (2000), examples include (1) claiming that negative studies are invalid because the researchers did not receive EMDR-sanctioned training (Shapiro, 1995a), despite the absence of evidence supporting the specific benefits of such training (Rosen, 1999); (2) claiming that Level II EMDR training
was necessary following negative studies conducted by investigators who had received only Level I training (Shapiro, 1995b); (3) arguing that component-control procedures are actually heretofore unknown variants of EMDR (Shapiro, 1995a); and (4) questioning the competence, motives, and scientific integrity of EMDR critics (Russell, 2008; Shapiro, 1995b).

Some EMDR proponents have further characterized the findings of dismantling studies as "inconclusive," as a result of methodological problems (e.g., Shapiro, 2002) and have argued that firm conclusions that bilateral stimulation techniques lack specific efficacy in EMDR are unjustified (Perkins & Rouanzoin, 2002) and reflect "confirmatory bias" on the part of EMDR critics (Russell, 2008). This perspective reveals a reversed burden of proof in which a claim can be assumed to be true until it has been proven false beyond a reasonable doubt. Although the burden of proof in science rests on the claimant (McFall, 1991), Shapiro and colleagues have not produced convincing evidence in support of the claim that eye movements and related techniques are specifically efficacious for PTSD. Rather, studies that fail to support the purported therapeutic benefits of bilateral stimulation in EMDR are dismissed for various reasons, and finger movement, auditory tones, and kinesthetic tapping remain integral to the theory and practice of EMDR. As such, EMDR's "reliance on a nonfalsifiable neurobiological model of EMDR that is continually modified in the context of disparate research findings" (Russell, 2008, pp. 1740–1741) continues to represent a barrier to the scientific legitimacy of this treatment approach (Devilly, 2002).

**EMDR as a Novel and Distinct Treatment**

The scientific literature on EMDR supports several conclusions: (1) EMDR is an efficacious treatment for PTSD, (2) the efficacy of EMDR is comparable with that of trauma-focused CBT approaches such as PE, and (3) eye movements and other bilateral stimulation techniques appear to be unnecessary and do not uniquely contribute to clinical outcomes. The characteristic procedural feature of EMDR appears therapeutically inert, and the other aspects of this treatment (e.g., imaginal exposure, cognitive reappraisal, *in vivo* exposure; Shapiro, 2001) overlap substantially with those of exposure-based treatments for PTSD. Despite its status as an evidence-based psychotherapy that is recommended as a first-line treatment for PTSD in clinical guidelines (e.g., Department of Veterans Affairs/Department of Defense, 2010), EMDR offers few, if any, demonstrable advantages over competing evidence-based psychological treatments. Moreover, its theoretical model and purported primary active therapeutic ingredient are not scientifically supported. Accordingly, the scientific status of EMDR characterized by McNally's (1999) maxim, "What is effective in EMDR is not new, and what is new is not effective" (p. 619), still holds today.

In response to findings that bilateral stimulation techniques are
irrelevant to the efficacy of EMDR, Shapiro (2002) emphasized the numerous components that comprise this therapy and claimed that, "as with any complex treatment, the elimination of a single component is likely to have little effect" (p. 8). Such statements risk obfuscating critical empirical and theoretical issues. If bilateral stimulation is unnecessary for EMDR's efficacy, then it is incumbent on EMDR's proponents to specify the essential features of the treatment to permit controlled experiments designed to assess the relative effects of procedural artifacts and the substantive clinical procedure (Grunbaum, 1985). Without a clear specification of the necessary (characteristic) features of treatment, any number of convenient ad hoc accounts can be advanced to explain away disconfirming evidence. Under such conditions, the theory may be difficult or impossible to test unless much more specific predictions are advanced (see Herbert et al., 2000, for a more complete discussion of these issues; see also Lilienfeld, Lynn, & Lohr, Chapter 1, this volume).

Critical Incident Stress Debriefing and Management

Another aspect of the expansion of clinical services in the trauma field has been the development of procedures to prevent PTSD in trauma-exposed individuals. "Psychological debriefing" quickly emerged as a prophylactic approach to minimize the presumed ill effects of occupational exposure to stressful career episodes in first responder groups (Stuhmiller & Dunning, 2000) and rapidly extended its reach to include a broad range of other "exposed" populations. By the time of the 2001 attacks on the World Trade Center, Kadet (2002) reported that as many as 9,000 purveyors of this prophylactic method converged upon New York City, contending that intervention would be needed by essentially anyone even remotely impacted by the atrocities. The most widely promoted of these interventions has been critical incident stress debriefing and management (CISD; Mitchell, 1983, 1988a, 1988b; Mitchell & Everly, 1993, 1995, 1998). CISD is predicated on the assumption that exposure to ostensibly traumatic life events is a sufficient precursor for the development of psychological symptoms that can readily grow to pathological proportions, and that early and proximal intervention involving some element of emotional catharsis is necessary and sufficient to prevent such sequelae.

Early dissemination and promotion of the technique was based on frequent claims of scientific evidence for its efficacy. Yet, no published outcome studies were found despite extensive efforts to uncover them, and, in some cases, data claimed to have formed the basis for key constructs were ultimately conceded to be unavailable (Gist, Woodall, & Magenheimer, 1999). Meanwhile, widespread application had begun to attract serious and independent study. Gist, Lubin, and Redburn (1998) reported studies of debriefing-styled interventions following the crash of a wide-bodied airliner in which 112 passengers died. Their findings from a nearly
complete sample of career firefighters engaged in body recovery and related operations showed no clinically significant impacts on personnel at 2 years postincident, no evidence of superior resolution for debriefed responders versus those who declined, a slight but statistically significant negative trend in resolution indices for those accepting debriefing, and a clear preference for informal sources of support and assistance that correlated strongly with effective resolution. Other studies have replicated and amplified these core conclusions (Bisson, Jenkins, Alexander, & Bannister, 1997; Carlier, Lamberts, van Uchelen, & Gersons, 1998; Deahl, Gillham, Thomas, Dearle, & Srinivasan, 1994; Griffiths & Watts, 1992; Hobbs, Mayou, Harrison, & Worlock, 1996; Kenardy et al., 1996; Lee, Slade, & Lygo, 1996; McNally, Ehlers, & Bryant, 2003; Rose & Bisson, 1999).

A meta-analysis by Van Emmerick, Kampius, Hulsbosch, and Emmelkamp (2002) of seven outcome studies revealed that the effect size for CISD was not different than zero (including a range of negative values within its 95% confidence interval) and that CISD was less effective than either non-intervention control or alternative interventions. A widening range of guidelines for evidence-based practice, including the Cochrane Reviews (Rose, Bisson, & Wessely, 2004), the UK National Institute for Clinical Excellence (NICE, 2005), the World Health Organization (2006), and the Australian Centre for Posttraumatic Mental Health (2007), have offered specific recommendations contraindicating routine debriefing in the wake of trauma.

Although these findings have progressively reduced the endorsement of the technique in many circles, affinity and adherence among many of its core advocates have paradoxically intensified. Indeed, CISD subsequently was modified and transformed into critical incident stress management (CISM), though little in the way of substantive difference in form or application was established (Devilly, Gist, & Cotton, 2006). Gist et al. (1999) suggested that the intensification of promotion is an essential feature of the “groupthink” processes that commonly fuel and maintain pseudoscientific enterprises, and of the “true believer” characteristics of those attracted to such movements.

The International Critical Incident Stress Foundation (2012) was founded by Jeffrey Mitchell and George Everly to promote CISD and CISM, and to provide a vehicle for marketing the training and dissemination of promotional literature. Internal Revenue Service returns for the tax-exempt foundation reveal that its revenues have fallen sharply (by nearly half in the past 5 years); workshop frequency and attendance have dwindled; staff have been jettisoned; and salaries of remaining positions have been reduced. Meanwhile, the number of “CISM teams” maintaining certification through the organization has continued a steep downward trend.

Having built its initial following from the volunteer fire service, the circle came to full closure when the National Fire Protection Association (2012) voted overwhelmingly to remove reference to CISM from its Standard on Fire Department Occupational Safety and Health Program. Other
core proponents, however, had already opted for the “reinvention” tactic. CISD has been recast as “psychological first aid” for several years (e.g., Evertz & Flynn, 2006; Parker, Evertz, Barnett, & Links, 2006). Despite the efforts of the National Child Traumatic Stress Network to brand and market Psychological First Aid (PFA) as a proprietary program, the majority of references to PFA cited in the PubMed database come from CISD promoters and the International Journal of Emergency Mental Health, published by CHEVRON Publishing, a subsidiary of ICISF.

**SCIENCE-BASED TREATMENTS FOR TRAUMA-RELATED DISORDERS**

**Cognitive-Behavioral Theory**

Although numerous psychosocial theories have been advanced to explain the etiology of PTSD, behavioral and cognitive models have the strongest empirical support and are the most widely accepted by the scientific community (Foa & Meadows, 1997; Hofmann & Smits, 2008; Tolin, 2010). The behavioral model of PTSD, as originally posited by Keane, Zimering, and Caddell (1983), suggests that traumatized individuals acquire conditioned fears to a wide assortment of trauma-related stimuli and subsequently avoid those stimuli. Through the processes of higher-order conditioning and generalization, the number of feared stimuli continues to increase even after the trauma has occurred. The cognitive model later introduced by Foa, Stekete, and Rothbaum (1989) holds that PTSD develops when the traumatic event reinforces negative beliefs concerning one’s safety and competence. Individuals with PTSD often believe the world to be dangerous and unsafe and therefore live in almost constant fear. They may also believe themselves to be incompetent in effecting control, and they are reluctant to confront challenging situations. Other cognitive models focus on such basic processes as attention, memory, and probability estimation (e.g., Litz & Keane, 1989). According to these models, PTSD develops and/or is maintained when trauma- or threat-related information receives preferential information over less threatening information. This processing bias leads to distorted ways of perceiving and understanding the world.

**Cognitive-Behavioral Treatments**

Cognitive and behavioral models of PTSD have informed several treatment strategies. We describe those with a substantial body of scientific evidence to address treatment efficacy, and we limit our literature review to RCTs. These are efficacy studies in which people diagnosed with PTSD have been randomly assigned to treatment conditions, at least one of which is designed to control for possible artifacts, such as placebo effects and statistical regression. Although many different treatments fall under the rubric
of “cognitive-behavioral,” we limit our discussion to three broad classes of interventions for PTSD: prolonged exposure (PE), anxiety management training (AMT), and cognitive processing therapy (CPT).

Prolonged Exposure

Exposure-based treatments are predicated on the notion that exposures to feared stimuli facilitate habituation or extinction of learned fear (Tryon, 2005). Imaginal exposure involves instructions to imagine the traumatic event as vividly and as fully as possible. For example, a combat veteran could be instructed to imagine his experiences in detail, including visual, auditory, and olfactory features of the event. In vivo exposure generally involves the construction of a hierarchy of safe but avoided exposures, with encouragement to confront them gradually. For example, a rape victim who is afraid to stay home alone could be instructed to remain at home for progressively longer periods of time. Such terms as “prolonged exposure” or “flooding” are often used to describe imaginal and/or in vivo exposure exercises in which exposure is applied for prolonged periods of time. Systematic desensitization includes imaginal exposure, which is paired with an anxiety-incompatible response, such as relaxation. Typically, the exposures in systematic desensitization are more gradually applied, and for briefer periods of time, than in PE.

An early randomized control trial of prolonged exposure for PTSD examined imaginal exposure with combat veterans (Keane, Fairbank, Caddell, & Zimering, 1989). Compared with a wait-list control condition, PE produced greater reductions in PTSD symptom severity on both standardized measures and clinician ratings. Treatment gains were maintained at 6-month follow-up. Similar results were reported by Brom, Kleber, and Defares (1989) using systematic desensitization for civilians who had experienced a wide variety of traumatic experiences. A treatment combining imaginal and in vivo exposure was superior to supportive counseling and wait list, and marginally superior to stress inoculation training (see next section) for sexual-assault-related PTSD (Foa et al., 1999; Foa, Rothbaum, Riggs, & Murdock, 1991). In a mixed sample of civilians with PTSD, Marks, Lovell, Noshirvani, and Thrasher (1998) showed that imaginal PE was roughly equivalent to cognitive therapy (CT; Tarrer et al., 1999a). Combined imaginal and in vivo PE was shown to be superior to wait list, comparable to CT, and superior to progressive muscle relaxation training (PMR). The PE component is no less effective than a treatment that combines PE with cognitive restructuring (Foa et al., 2005). The effectiveness of PE was examined by Aderka, Gillihan, McLean, and Foa (2013) in a reanalysis of the data from Foa et al. (2005). Multilevel mediational analyses showed that PE primarily affects PTSD symptoms, which in turn reduce depressive symptoms. ASD can also be treated efficaciously with CBT that contains a PE component (Bryant, Harvey, Dang, Sackville, & Basten, 1998; Bryant, Moulds, Guthrie, & Nixon, 2005; Bryant, Moulds,
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& Nixon, 2003; Bryant, Sackville, Dang, Moulds, & Guthrie, 1999). Moreover, there is no empirical evidence that PE presents greater risk for harm than any treatment (Foa et al., 2013). The development and use of exposure-based therapies to treat PTSD and related anxiety disorders is one of the great success stories of the mental health field (Frueh, Turner, & Beidel, 1995; Olutunji, Deacon, & Abramowitz, 2009; Tryon, 2005). Such therapies now constitute the first-line treatments for such disorders, although their degree of dissemination falls far short of the evidential warrant of their effectiveness (Foa et al., 2013).

Anxiety Management Training

AMT, also known as stress inoculation training, refers to an armamentarium of cognitive and behavioral strategies designed to reduce symptoms of anxiety, irritability, and hyperarousal. These techniques include psychoeducation, which involves teaching patients about trauma and typical responses to it; relaxation training, in which patients are taught to reduce muscle tension; breathing retraining, which aims to prevent hyperventilation; self-instruction, in which patients are taught to solve problems by “coaching” themselves mentally; communication training, which is aimed at improving interpersonal functioning; and cognitive therapy, which is aimed at modifying dysfunctional expectations of danger, beliefs about the inability to control stressors, and other errors in interpretations regarding the nature and occurrence of stressful events. Such protocols have been compared with PE in two RCTs. Using a civilian sample of assault victims, Foa et al. (1991) showed that AMT reduced symptoms of PTSD, although the effects were slightly less pronounced than those produced by combined and imaginal reexposure. In a later study, Foa et al. (1999) later compared PE, AMT, and the combination of PE and AMT with a wait-list control condition among assault victims. AMT decreased symptoms using standardized measures of PTSD, although exposure produced greater effects. There was no significant difference between AMT and the combined treatment, and the combined treatment was less effective than PE alone. Thus, AMT by itself appears to be an effective treatment for PTSD.

Cognitive Processing Therapy

Alternative treatment procedures de-emphasize the behavioral (task-specific) content of treatment and instead focus on the interpretational, attitudinal, expectational, and memory-based means of modifying stress-related symptoms. Although such procedures are usually targeted at depressive symptoms, they have been applied to PTSD (Marks et al., 1998). Tarrier et al. (1999a) compared cognitive therapy (CT) with imaginal PE for mixed civilian trauma and showed that both were superior to a wait list and were comparable in symptom reduction at the end of treatment at both 6-month and 12-month follow-ups (Tarrier et al., 1999b). A 5-year follow-up of 54% of
the original treatment completers found that participants in the CT condition reported fewer PTSD symptoms than those in the imaginal PE condition (Tarrier & Sommerfield, 2004).

Another cognitive-behavioral application has emphasized the “processing” of traumatic memories as the central feature of treatment. The CPT model was developed for those individuals, primarily women, who had experienced one or more sexual assaults that preceded the development of PTSD (Resick & Schnicke, 1992). Treatment focuses on modifying the dysfunctional beliefs that develop following sexual assault. For example, postassault dysfunctional beliefs regarding the generality of personal danger are challenged Socratically in terms of their “truth value.” Behavioral tests are used to determine their accuracy and prospective applicability. For example, if a postassault patient believes she is incompetent to avoid danger and harm, suggestions for the assumption of personal agency or responsibility may be posed as a means of testing the veracity of the belief. Should she act in a competent manner, that fact is used as evidence that personal competence is greater than previously assumed.

The theory underlying CPT proposes that the experience of sexual assault influences people’s cognitive “schemata” about themselves, other people, and the world (Horowitz, 1976). More specifically, the rape experience influences the victim’s sense of safety, trust, power, competence, esteem, and intimacy in ways that have a negative impact on schemata (McCann, Sakheim, & Abramson, 1988). CPT is focused on identifying such maladaptive schemata and their personal significance in more adaptive processing of rape-related beliefs and attributions.

The theory of PTSD maintenance prescribes that the cognitive content of CPT is the specific and characteristic feature. The victim is first provided with psychoeducational information about the functional connection between cognitive processes as antecedents of negative emotions and maladaptive behavior. The process involves the consideration of cognitive schemata about self, others, and the world and the way in which those schemata relate to safety, trust, power, competence, esteem, and intimacy. This goal is accomplished with the use of narrative impact statements that the client writes at the beginning and the end of treatment. During treatment, the therapist uses Socratic questioning to call into challenge the “truth value” of maladaptive thinking patterns about the personal significance of the assault experience.

The process of treatment also involves more specific narrative recounting to the worst-case assault experience as the focus of two early sessions of treatment in which negative emotions are connected to the event. Clients are also asked to read the narrative each day before the subsequent treatment session. The narrative exposure component is intended to activate the maladaptive schema and allow corrective information to be processed into more adaptive schemata. The treatment process is prescriptive, with specific treatment activities scheduled for each of the 12 sessions (Resick & Schnicke, 1993).
The efficacy of CPT has been addressed in a number of outcome studies. Resick and Schnicke (1992) randomly assigned rape victims to either a wait list or CPT treatment condition. Treatment was administered in group format for 12 sessions. Analysis of pre-post PTSD and depression measures showed statistically significant reductions in the CPT group. The difference in improvement was maintained at 3- and 6-month follow-up. In the CPT group, there was also a reduction in depressive symptoms from posttreatment to 3-month follow-up. At 3 months posttreatment, only 2 of 19 women in the CPT condition met the criteria for PTSD, and none met PTSD criteria at 6-month follow-up.

A second study compared CPT and PE with a minimal attention (MA) control condition (Resick, Nishith, Weaver, Astin, & Feuer, 2002). Women in the MA condition were informed that they would be provided treatment 6 weeks following administration of assessment procedures for all participants. They were told that during the interim they could call and talk to a therapist should the need arise. Analysis of PTSD, depression, and guilt measures showed statistically significant reductions in both treatment conditions relative to the MA condition. Direct comparisons between PE and CPT in those completing treatment revealed small to moderate effects sizes in favor of CPT on measures of PTSD and depression at posttreatment and 3-month follow-up. At 9-month follow-up, a small effect size favored PE. In a reanalysis of the data, Gallagher and Resick (2012) found that CPT reduced hopelessness, and this predicted reductions in PTSD symptoms. PE also reduced PTSD symptoms but did so independently of changes in hopelessness. Thus, a reduction of hopelessness may be a major mechanism of action for CPT.

A number of studies derived from the findings of Resick et al. (2002) have addressed issues of treatment effectiveness. A 5-year follow-up study on 87% of treatment completers showed that reductions in symptoms were maintained with no statistically significant differences between treatment conditions. Seventy-eight percent of those who participated in CPT no longer met the criteria for PTSD, and 83% of those who participated in PE no longer met the criteria for PTSD.

Nishith, Resick, and Griffin (2002) examined the pattern of clinical change over the course of the treatments. Reexperiencing symptoms increased in both groups before improvement occurred. Hyperarousal symptoms remained constant until the fourth treatment session and gradually declined. Avoidance symptoms and total symptoms also declined after the fourth session. Participants in CPT showed a linear decline and participants in PE showed a quadratic decline, indicating that intensive PE first produced an increase in avoidance symptoms that did not occur in CPT. Rizvi, Vogt, and Resick (2009) examined the predictive value of personal characteristics in the reduction of trauma-related symptoms. The dropout rate was greater in younger, less intelligent, and less educated participants. Depression, trait anger, and guilt did not predict dropout in general, but trait anger predicted greater dropout in the PE condition. Treatment
efficacy was unrelated to age, intelligence, and education, but younger women displayed better outcome with CPT, older women in PE had the next best outcome, and younger women in PE had the poorest outcomes. Greater depression and guilt predicted greater reductions in PTSD symptoms in both treatment conditions.

Nishith, Nixon, and Resick (2005) examined the potential effects of comorbidity between major depression and PTSD in the treatment of CPT for guilt. Participants comorbid for PTSD and depression showed higher depression and PTSD symptoms at intake relative to participants without depression. There was no difference in effectiveness in the comorbid participants relative to the PTSD-only participants. However, CPT showed greater effectiveness than PE. As sleep-related problems and health-related problems are common in PTSD (Green & Kimerling, 2004; Ohayon & Shapiro, 2000), Galovski, Monson, Bruce, and Resick (2009) examined changes in these variables following CPT and PE. The results showed that sleep quality was improved by both treatments and at 9-month follow-up. Health-related concerns were also reduced in both treatments but more so in CPT.

Demonstration of the efficacy and effectiveness of a CPT protocol should be followed by attempts to identify the specific or characteristic features of the treatment that are primarily responsible for the beneficial effects (Borkovec & Castonguay, 1998; Lohr et al., 2003). Resick et al. (2008) conducted such a study to examine the characteristic features of CPT. Participants were 150 women diagnosed with PTSD who had an extensive history of interpersonal violence. Participants were randomly assigned to one of three treatment groups: complete CPT; CPT-C, which was identical to CPT but without the written, narrative trauma accounts; and only written accounts (WA). Treatment was administered in group format in 7 to 12 sessions across a period of 6 weeks, during which treatment adherence and competence were independently assessed. Standardized measures of PTSD and depression were administered pretreatment, weekly during treatment, posttreatment, and at 6-month follow-up. Participants in all three conditions improved on measures of PTSD and depression, with no statistically significant differences among the treatment conditions. Thus, it appears that a form of narrative recounting is an active component of treatment, as is the component specific to cognitive processing. However, the findings suggest there is little beneficial interaction of the two components. In sum, PE, AMT, and CPT all appear to be efficacious, and CPT may possess greater effectiveness for related clinical conditions. In a reanalysis of Resick et al. (2008), Liverant, Suvak, Pineles, and Resick (2012) further examined treatment effectiveness. Multilevel regression analyses showed that the reductions of PTSD and depressive symptoms were strongly related and that they were reduced independently and concurrently. Thus, CPT appears to have a highly desirable side effect for depressive impairments that are common in sexual assault-related PTSD.
Optimism about the efficacy of CPT, however, must be cautious. There are only three published studies on CPT efficacy, whereas PE and AMT have been subjected to far more empirical tests. Moreover, the investigators who developed CPT are those who published the studies demonstrating efficacy, raising the possibility of researcher allegiance effects (Gaffan, Tsaousis, & Kemp-Wheeler, 1995; Leykin & DeRubeis, 2009; Luborsky et al., 1999; Tolin, 2010).

FUTURE DIRECTIONS

Psychological First Aid

The failure of CISD/CISM to achieve its stated objectives and, more pointedly, its tendency to impede coping reactions among particularly sensitive subgroups created an interesting conceptual and practical vacuum. Although resilience is the modal trajectory in the face of trauma (Bonanno, 2004), it has become a social expectation that “mental health assistance” will follow any untoward experience in life, be it in the workplace, the schools, or the community. “Critical incident” programs are an essential feature of workplace employee assistance programs, school crisis response plans, and community response programs such as the U.S. Department of Homeland Security’s Community Emergency Response Teams (CERT) and the U.S. Department of Health and Human Services’ Medical Reserve Corps. It was all but inevitable that some program, hopefully one with a more substantial evidence base, would appear to fill the interventionist void.

The most promising candidate was the psychological first aid (PFA) project of the National Child Traumatic Stress Network (NCTSN), carried out in partnership with the Veterans Administration’s National Center for PTSD (NCPTSD). This project was the work of an eight-member core team, drawing on their academic resources and practical experience to create an “evidence-informed” intervention (Brymer et al., 2006) in the form of a “Field Operations Guide.” Included are “eight core actions” that PFA implements:

1. Contact and engage with affected persons in a nonintrusive, compassionate, and helpful manner.
2. Provide safety and comfort to enhance immediate coping.
3. Stabilize emotionally overwhelmed and distraught survivors.
4. Gather information to identify immediate needs and concerns.
5. Offer practical help in meeting needs and concerns.
6. Connect with social supports, including family, friends, and community helping resources.
7. Obtain information to aid in coping with the event and aftermath.
8. Link survivors with immediate and likely needed services.
Since that time, PFA has been expanded to include versions for chaplains and pastors, CERT groups, Medical Reserve Corps volunteers, schools, and other constituencies; many workshops have been held; web-based training has been developed; and Smartphone applications are under development.

Despite the outpouring of resources and effort that has gone into promoting the product, a void exists with respect to its evaluation. Reports have appeared in various service venues examining the perceived applicability of the techniques and providing Likert-style feedback regarding perceptions of providers trained to administer PFA (e.g., Allen et al., 2010). Moreover, descriptions of the material proclaiming its applicability and promoting its further dissemination abound (Brymer, Steinberg, Sornborger, Layne, & Pynoos, 2008; Ruzek et al., 2007; Vernberg et al., 2008). Although the advocates of PFA indicate that outcome research is needed, little has been accomplished.

These and other considerations suggest that the promotion of PFA may be replicating rather than rectifying the pseudoscientific practices of CISD. These practices include:

1. **Limited claims versus expansive reach.** Promoters of CISD claimed that it was preventative for any population in essentially any situation. Initially targeted to a limited population of first responders in a limited set of circumstances, it was quickly taught to all comers and applied to numerous situations from workplace to schools, from terrorism to corporate downsizing. PFA was initially targeted toward mental health personnel assisting victims of disaster, but is now promoted for essentially the same, nearly unlimited expanse. Neither program, however, has provided evidence of applicability before venturing into expanded areas of application, nor has either adduced evidence of impact across these applications and settings.

2. **Measurement of outcomes versus indices of receptivity.** Both CISD and PFA have reported subjective responses of recipients as if they were indicators of outcome (Allen et al., 2010; Robinson & Mitchell, 1993). Subjective reports of benefits may result in the belief that the activity is helpful and that the training aided in the delivery of the intervention. However, these beliefs do not ensure that the intervention delivered actually made a difference in a defined and measurable outcome. Indeed, CISD data demonstrated that anecdotal endorsements show no systematic relationship to clinical outcome (Devilly et al., 2006). The absence of any reported data regarding actual outcomes for PFA raises similar concerns.

3. **Portrayal of the ubiquitous as if uniquely innovative.** CISD was the packaging of the basic social psychological group process for market to a specific service provision niche. PFA may also represent the recitation of basic common-sense palliative actions, known for generations of informal application as a branded psychological intervention.

4. **Overstatement of evidential basis.** CISD claimed to be a “proven”
approach with wide-ranging evidence to support efficacy and utility when little actual evidence existed. Over a decade of substantive scientific inquiry, evidence accumulated by independent researchers not only failed to support those assertions but contradicted them (Devilly et al., 2006). PFA, though declaring itself to be an “evidence-informed” approach, has yet to provide any mapping of its purported evidence base onto its specified actions and has added no data in support of its efficacy or effectiveness. The evidence base represents, at best, the consensus of a select group of authors regarding best practices. This type of evidence occupies the lowest tier in most evidentiary hierarchies accepted for evidence-based practice (National Institute for Clinical Excellence, 2004, p. 7-6; Oxford Centre for Evidence Based Medicine, 2012).

The notion of psychological first aid is hardly new or unique. It dates back at least 65 years (Blain, Hoch, & Ryan, 1945), and many independent variations exist today (e.g., Burke & Richardson, 2012; Everly & Flynn, 2006; Kitchener & Jorm, 2002; World Health Organization, 2011). Their commonality is that they all advance a collection of pragmatic folk wisdom and basic helping steps with little scientific grounding. The promotion of named or “branded” applications, as if they were “evidence informed,” is questionable. Defending them as if they represented a proprietary product or patent remedy, while they lack compelling empirical support, suggests the promotion of pseudoscientific techniques.

Resilience Training for Postevent High-Risk, High-Impact Groups

Conceptual Issues

To understand variations among individuals in how they respond to stressful events, researchers have examined risk factors for pathological reactions, typically using post hoc designs. Such studies tell us something about the people who have had maladaptive reactions to life’s adversities—their personality profiles, life experiences and histories, and usual methods of coping with adversity—all through retrospective lenses. Such approaches are informative regarding the nature and course of pathological reactions, but they tell us little about why people stay healthy.

Three distinct but related questions arise:

1. Why do some people who experience severe life trials bounce back to normal functioning very quickly?
2. What helps people to resolve traumatic experiences over time?
3. What information is needed to inoculate people most at risk (e.g., emergency or military service) against unhealthy reactions?

The last question has recently led organizational and clinical consultants to offer resilience training as a means of promoting health under
severe risk. However, there is scant evidence for the use of any form of resilience, and there is even less agreement regarding what resilience means.

Three groups of resilient outcomes have been distinguished: those in which (1) at-risk individuals show better than expected outcomes; (2) individuals maintain positive adaptation despite stressful experiences; and (3) individuals show good recovery after a traumatic incident (Masten, 1994; Masten, Best, & Garmezy, 1990). Such a perspective, however, views resilience as an outcome trajectory distinct from the type of responses typically associated with recovery from trauma (Bonnano, 2004). Many individuals who undergo a traumatic event and go on to recover without developing PTSD, often experience subthreshold levels of psychological symptoms and significant disruption of daily functioning. In contrast, resilient individuals may experience only mild and transient disruptions in physical and emotional well-being (e.g. sleeplessness, negative affect, difficulty concentrating), with relatively stable levels of adjustment over time (Bonnano, Rennicke, & Dekel, 2005).

Inoculation Training

Bonnano (2005) noted that resilience in adults typically occurs following an isolated and usually brief traumatic event. Under such circumstances, resilience involves immediate and pragmatic forms of coping rather than long-term strategies. To our knowledge, only one published controlled field trial has examined the effects of resilience training on adults following traumatic life events. Nevertheless, it was not an RCT. Sharpley, Fear, Greenberg, Jones, and Wessely (2008) referred to their intervention as pre-deployment stress briefing when provided to the United Kingdom’s armed forces (Royal Navy and Royal Marines) before deployment to the 2003 Iraq War. This intervention consisted of education regarding the “role of the mental health team; an outline of the medical facilities in the Primary Casualty Receiving Facility; definition of stress, pressure and strain; types of stressors (physical, social, occupational, and traumatic); effects of stress on individuals; advice on handling human remains; managing stressful thinking in a chemical or biological environment; simple advice on reducing stress; the importance of morale; levels of support available and when/where to seek this” (Sharpley et al., 2008, p. 31). Upon returning from Iraq, all troops completed a questionnaire regarding their reactions. Those who had received the pre-briefings were designated as the treatment group, and those personnel not registered as having received the pre-briefings were designated as a no-treatment control. As may be expected when using post hoc and self-selected samples, the treatment group differed significantly from the control group on a number of variables. Most notably, they experienced a higher number of traumatic events and more often played a combat role during deployment. The results, though not
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statistically significant, pointed toward lowered pathology in the prebriefing group.

In the U.S. military, a plan has recently emerged to develop and use a resilience training program known as comprehensive soldier fitness (CSF; Cornum, Matthews, & Seligman, 2011). Based on concepts drawn from positive psychology (Seligman & Csikszentmihalyi, 2000; Seligman, Steen, Park, & Peterson, 2005), CFS aims to create psychological resilience based on facilitating personal growth, developing skills to reduce the sequelae of traumatic exposure, and helping military personnel and their families cope with the stress of prolonged, dangerous deployments. Proponents of the method claimed on websites (and in varying forms in conference presentations) that CSF is a long term strategy that better prepares the Army community—including all Soldiers, Family members, and the Department of the Army Civilian workforce—to not only survive, but also thrive at a cognitive and behavioral level in the face of protracted warfare and everyday challenges of Army life that are common in the 21st Century. The program, based on 30-plus years of scientific study and results, uses individual assessments, virtual training, classroom training, and embedded resilience experts to provide the critical skills our Soldiers, Family members and Army Civilians need. (Comprehensive Soldier Fitness, 2012)

Likewise, a program originally called “Battlemind” and now known as “resilience training” is also being promoted by the U.S. military. Battlemind has been empirically investigated (Adler, Bliese, McGurk, Hoge, & Castro, 2009) but only when used postdeployment, as an alternative to psychological debriefing. Similarly, the Australian Defence Force has been utilizing a program called “BattleSMART.” As explained by the national coordinator of the program:

The resilience training program, dubbed BattleSMART (Self-Management and Resilience Training), is a cognitive-behavioural based program that aims to develop both arousal reduction techniques (i.e., the Self-Management component) and adaptive cognitive coping strategies. (Cohn, Hodson, & Crane, 2010, p. 16)

Despite the good intentions of military leaders, McNally (2012) expressed concern that CFS was implemented without controlled research to determine its efficacy or risks. He noted that it would have been desirable to conduct an RCT to determine whether it reduces rates of post-vent PTSD in comparison with the military’s standard (previous) program (Tedeschi & McNally, 2011). The paucity of empirical evidence and the methodological limitations of the available evidence have prompted Steen-kamp, Nash, and Litz (2013) to question the widespread implementation of CSF and to call for more systematic study of its efficacy and effectiveness.
Pre-event Training for High-Risk, High-Impact Groups

Although no data support the efficacy or effectiveness of the postevent intervention, an alternative approach is to not wait for a high-impact stressor to occur, but to design prevention efforts that could be implemented prior to exposure to a potentially traumatizing event. Varker and Devilly (2012) published an RCT of inoculation (resilience) training using an analogue design. Outcome was based on people’s short- and long-term (4 weeks) reactions to watching a stressful video of paramedics attending the scene of a road traffic accident. The study provided a serial approximation to a stressful event, and in the experimental group psychoeducation and coping strategies were used to deal with aversive physiological responses and high levels of stress. In this study, the researchers provided community participants with either inoculation training or pragmatic training dubbed accident management training that provided practical tips and strategies on what to do if participants experienced or witnessed a traffic accident. Both trainings were provided to participants one week before they were exposed to a video that had been used previously to investigate the effects of psychological debriefing (Devilly & Annab, 2008; Devilly & Varker, 2008; Devilly, Varker, Hansen, & Gist, 2007). Those who received the inoculation training fared no worse than the control group on the main outcome measures. However, participants who received the inoculation training displayed improvements in negative affect (especially depression and stress levels), suggesting a more general positive result from the intervention than pragmatic training. These findings give us cause for cautious optimism.

PROFESSIONAL IMPLICATIONS FOR PSEUDOSCIENTIFIC PRACTICES

The American Psychological Association Ethical Principles and Code of Conduct (2002) are intended to hold practitioners accountable to the profession and the scientific discipline (Cottone & Tarvysad, 1998). The practice of pseudoscience in clinical psychology raises ethical implications for the mental health profession. For instance, the code’s preamble states that psychologists should work to develop a valid and reliable body of scientific knowledge based on research. Additionally, Principle B (integrity) states that psychologists should seek to promote integrity in the science, teaching, and practice of psychology. The General Standard, Basis for Scientific and Professional Judgments (1.06), states that psychologists should rely on scientifically and professionally derived knowledge when making scientific or professional judgments or when engaging in scholarly or professional endeavors.

There is little question that psychologists have the primary ethical obligation of Principium non nocere: First Do No Harm (either unwittingly or unwittingly). This obligation is most directly applied to acts of commission for which the public will incur significant cost, damage, or both.
Therefore, psychologists have an ethical obligation to be informed of clinical procedures that have been shown to be potentially harmful (Barlow, 2010a; Lilienfeld, 2007). The obligation, however, also applies to clinical acts of commission in which there is evidence that the purported benefits of a treatment are absent, or in which there is an absence of evidence that the treatment is beneficial. In the latter case, the application of such a treatment can be ethically defensible if the clinical psychologist is aware that little evidence exists, and when the clinical psychologist informs the client of that fact. That is, the client should be informed (1) of the fact that the treatment is not “usual and customary,” (2) of what the usual and customary treatments are, and (3) of the rationale for applying the treatment in addition to, or instead of, the usual and customary treatments. In this way, the client can make an informed decision about participating in an “experimental” treatment application. In addition, the psychologist can avoid the professional pitfalls of overpromoting a treatment to which he or she has an allegiance (Luborsky et al., 1999).

Where there exists evidence that a treatment is ineffective or that a treatment’s effectiveness is due to factors other than the specificity of the treatment, ethical obligations also apply. As in the case of EMDR, the clinical practitioner has two obligations: inform the client (1) of alternative, efficacious treatments, and (2) inform the client that the specific features of the treatments (eye movements) are inert components of the clinical procedure. To provide such informed consent, the practicing clinician must keep abreast of the research on the efficacy and effectiveness of those treatments. To address the problem of pseudoscience in the mental health domain, practitioners must actively embrace their professional and ethical obligation to be knowledgeable about the empirical basis for their treatment. This mandate compels practitioners to stay abreast of the relevant literature, including distinctions between science and pseudoscience (Haas & Malouf, 1995).

The profession of psychology requires specialized skills and methods that are based on scientific knowledge (Sinclair, Simon, & Petifor, 1996). However, if there is a proliferation of treatments that are not based on scientific principles, the implications for the status of professional clinical psychology are substantial. Mental health practitioners may be increasingly vulnerable to pseudoscientific promotion, given that accelerating demand for clinical services has sometimes led to reduction of scientific training (Dawes, 1994; Singer & Lalich, 1996). By appealing to more explicit criteria for methodological precision in treatment validation (e.g., Borkovec & Castonguay, 1998; Foa & Meadows, 1997), practitioners may begin to ask specific questions aimed at determining the efficacy of a given treatment. These questions should include the following:

Does the treatment work?
If the treatment works, how does it work?
What are the mechanisms of change?
Questions can then be addressed regarding the theoretical foundations of the treatment. Such questions regarding theoretical rationale may prove to be vital in separating science from pseudoscience. Practitioners are also encouraged to proceed with caution when presented with treatments that claim to be effective for a wide range of disorders. Scientific interventions typically have clear-cut boundaries in their applicability. Treatments that purport to have limitless boundaries are often indicative of a pseudoscience (see Lilienfeld, Lynn, & Lohr, Chapter 1, this volume).

Mental health practitioners are at serious risk for the acceptance of pseudoscientific trauma services, given that the increased demand for the provision of clinical services may have resulted in a decline of scientific training. It is not surprising, therefore, that the profession is plagued with an industry of procedures lacking in empirical support (Beyerstein, 2001) and are frequently practiced with a trusting laity. The evaluation of all psychosocial treatments must rest on the substantive aspects of procedure rather than on its superficial appearance. The practice and research communities will benefit only when psychosocial interventions are marketed and accepted on the basis of compelling evidence. It is the compelling evidence, and the rigor of the research procedures from whence it derives, that will determine whether novel treatments can be incorporated into the corpus of science-based practice.

GLOSSARY

**Anxiety management training (AMT):** A set of cognitive-behavioral techniques designed to facilitate adaptive coping with stress. AMT components include relaxation training, breathing retraining, psychoeducation, self-instruction, communication training, and cognitive therapy. AMT as actually practiced may contain some or all of these components.

**Cognitive-behavioral therapy (CBT):** A set of therapeutic techniques based on cognitive and behavioral theories of psychopathology.

**Cognitive therapy (CT):** A form of psychotherapy that aims to modify dysfunctional beliefs or assumptions. CT techniques include Socratic questioning and behavioral tests.

**Critical incident stress debriefing (CISD):** A technique used to ward off posttraumatic stress symptoms among trauma-exposed individuals. It is predicated on the assumption that exposure to an ostensibly traumatic life event is a sufficient precursor to psychological symptoms, and that early and proximal intervention involving emotional catharsis is necessary and sufficient to prevent these outcomes.

**Exposure:** A cognitive-behavioral intervention for anxiety disorders. In exposure therapy, the patient either confronts previously avoided objects or situations in vivo or confronts previously avoided thoughts or memories.

**Measurement reactivity:** The spurious effect of prior administration of an assessment procedure on the results of a second administration of the same assessment procedure. Measurement reactivity may make it appear that an intervening
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treatment has resulted in beneficial change when the difference is only an artifact of the measurement process. The possibility of measurement reactivity requires the inclusion of the wait-list control condition to rule out procedural artifacts and reduce the probability of Type I error.

Systematic desensitization: A behavioral treatment procedure that includes the training of relaxation that is paired with imaginal or in vivo exposure to feared stimuli in a stepped or graduated manner.

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