



Scientific resistance to research, training and utilization of eye movement desensitization and reprocessing (EMDR) therapy in treating post-war disorders[☆]

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ARTICLE INFO

Article history:

Available online 22 October 2008

Keywords:

USA
Resistance
Zeitgeist
Military
Eye movement desensitization and reprocessing (EMDR)
Post-traumatic stress disorder (PTSD)
Psychotherapy

ABSTRACT

In this study, Barber's [(1961). Resistance by scientists to scientific discovery. *Science*, 134, 596–602] analysis of scientists' resistance to discoveries is examined in relation to an 18-year controversy between the dominant cognitive-behavioral paradigm or zeitgeist and its chief rival – eye movement desensitization and reprocessing (EMDR) in treating trauma-related disorders. Reasons for persistent opposition to training, utilization and research into an identified 'evidence-based treatment for post-traumatic stress disorder' (EBT-PTSD) within US military and veterans' agencies closely parallels Barber's description of resistance based upon socio-cultural factors and scientific bias versus genuine scientific skepticism. The implications of sustained resistance to EMDR for combat veterans and other trauma sufferers are discussed. A unified or super-ordinate goal is offered to reverse negative trends impacting current and future mental healthcare of military personnel, veterans and other trauma survivors, and to bridge the scientific impasse.

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Psychology, or more specifically psychotherapy, like any science, is a tale of the evolution of a body of knowledge by forward-thinking individuals whose creative endeavors often ran into fierce opposition, known as the zeitgeist of their times. Zeitgeist is originally a German expression meaning "the spirit of the age" (Mish, 1985; p. 1370). It describes the prevailing intellectual and cultural climate of an era, also sometimes referred to as dominant scientific 'paradigms' or 'schools'. The history of scientific discovery is replete with individuals and ideas clashing with accepted mainstream zeitgeist.

Progression of science and prominence

Several studies have reviewed theoretical analyses on the development of science and issues of prominence or zeitgeist (Robins, Gosling, & Craik, 1999; Tracy, Robins, & Gosling, 2005). For example, Kuhn (1970) advocates that scientific prominence is defined by the amount of attention afforded to a particular school's research findings and theories. Kuhn (1970) posits that science progresses from a 'preparadigmatic' stage with multiple competing schools that eventually merge into a 'paradigmatic' stage dominated by a single set of beliefs and methods, subject to replacement by successive paradigms. Lakatos (1970) viewed prominence as the extent of empirical support garnered for a particular school's basic assumptions over multiple competing schools at a given time. In contrast, Latour (1987) suggests that sociological factors determine dominance according to the degree research findings are disseminated through publications and conferences that attract attention and popularity.

[☆] The findings and opinions expressed are the authors' alone and are not intended to represent the views of the US Department of the Navy, the Department of Defense, or the Department of Veterans' Affairs.

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Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE OCT 2008		2. REPORT TYPE		3. DATES COVERED 00-00-2008 to 00-00-2008	
4. TITLE AND SUBTITLE Scientific resistance to research, training and utilization of eye movement desensitization and reprocessing (EMDR) therapy in treating post-war disorders				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Naval Hospital Yokosuka, Psychology, PSC 561 Box 626, FPO, AP, 96310				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT see report					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 10	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Similarly, in the case of psychology, scientific prominence has been likened to a 'history of fads' (Tracy et al., 2005) whereby dominance is relative to whichever theory is currently favored by the broader scientific and intellectual community as opposed to a specific schools' ability to document scientific truths. Empirical trend analyses of psychology have identified four dominant paradigms: psychoanalysis, behaviorism, cognitive psychology and neuroscience (Robins et al., 1999). Tracy et al. (2005) have argued for the substantial but relative prominence of the cognitive paradigm since the 1970s based on their examination of the subject matter of articles published in 'flagship' journals, dissertations and citations from each major school's core publications.

Adaptive functions of zeitgeist or resistance to change in science

The presence of predominant belief systems in a culture is adaptive; it provides individuals with a sense of coherence and organization to carry out their lives in society (Barber, 1961). Dominant belief systems provide necessary periods of stability allowing for assimilation and reflection to occur in order to adequately test or refine prevailing theoretical models. A zeitgeist can slow down change, thus avoiding a state of flux and chaos. By forcefully challenging new ideas before accommodating them into mainstream academics and practice, a zeitgeist prevents current theories from being abandoned prematurely in favor of unproven innovations (Barber, 1961). Barber goes on to indicate that scientific innovations are therefore expected to receive some degree of opposition by fellow scientists, quoting Trotter to this effect: "the reception of new ideas tends always to be grudging and hostile" (Barber, 1961, p. 597).

Potential harmful effects of zeitgeist and resistance to scientific discovery

Just as having fixed belief systems can serve adaptive purposes for individuals, society and science, they may also cause harm by blinding members of society to alternative views. Such cultural blinders were all too apparent in Galileo's case, but remain a constant source of resistance to any innovation despite formalized preventative methods and efforts by scientists (Barber, 1961). Intolerance can arise when a particular zeitgeist is threatened by unconventional models, leading to reflexive attacks aimed at preserving dominance. Left unchecked, a scientific community and culture rigidly operating under a certain zeitgeist will reinforce its convictions by selective attention to confirmatory evidence and dismissal of contrary facts (Barber, 1961; Mahoney, 1977a). An entrenched bias can emerge when academic research and healthcare agencies align under a theoretical view erecting formidable barriers for rival models. The net result is a science insulated by functional blinders prohibiting unbiased development and testing of rival hypotheses, creativity and advancement.

Resistance to scientific change: a case study in the treatment of combat stress

With over 400 variations of psychotherapies practiced, efforts to identify the most efficacious or 'evidenced-based treatments' (EBT) for psychological conditions were initiated in the 1990s and were driven by converging trends of evidenced-based medicine, professional accountability and cost-containment (DeAngelis, 2005). In 2004, the US Department of Veterans' Affairs and Department of Defense published clinical practice guidelines for treatment of traumatic stress (Department of Veterans' Affairs/Department of Defense, 2004). Four tier-one EBT were identified as providing significant benefit for post-traumatic stress disorder (PTSD): Cognitive Therapy, Exposure Therapy, Stress-Inoculation Training that will be collectively referred to as CBT and eye movement desensitization and reprocessing (EMDR; Department of Veterans' Affairs/Department of Defense, 2004). These same psychotherapies have been recognized by the American Psychological Association, Division 12 (Chambless et al., 1998), the American Psychiatric Association clinical practice guidelines for PTSD (APA, 2004), Cochrane Review (Bisson & Andrew, 2007) and at least six meta-analyses (Bisson et al., 2007; Bradley, Greene, Russ, Dutra, & Westen, 2005; Davidson & Parker, 2001; Maxfield & Hyer, 2002; Seidler & Wagner, 2006; Van Etten & Taylor, 1998) as best evidence-based treatments for PTSD.

Since its inception in 1989, the legitimacy of EMDR has been the subject of a long and impassioned scientific debate. However, after examining the empirical literature on PTSD treatments the US Department of Veterans' Affairs/Department of Defense (2004) expert panel concluded that:

- "Overall, argument can reasonably be made that there are sufficient controlled studies that have sufficient methodological integrity to judge EMDR as effective treatment for PTSD" (p. 5).
- "Exposure therapy may not be appropriate for use with clients whose primary symptoms include guilt, anger, or shame" (p. 4).
- "EMDR may be more easily tolerated for patients who have difficulties engaging in prolonged exposure therapy" (p. 2).
- "The possibility of obtaining significant clinical improvements in PTSD in a few sessions presents this (EMDR) treatment method as an attractive modality worthy of consideration"(p. 1).
- "EMDR processing is internal to the patient, who does not have to reveal the traumatic event" (p. 1).
- "EMDR has been found to be as effective as other treatments in some studies and less effective than other treatments in some other studies" (p. 9, summary).

All current evidenced-based treatments for post-traumatic stress disorder (EBT-PTSD) for combat-trauma were developed and tested with Vietnam-veterans years after discharge from the military starting in 1989 with generally mixed results (i.e., Creamer & Forbes, 2004).

Nevertheless, CBT are routinely endorsed as treatment of choice for combat-ASD/PTSD in the military (Department of Veterans' Affairs/Department of Defense, 2004; and VA's National centre for PTSD (Ruzek et al., 2004)). This is unsurprising since CBT has dominated scientific, academic and professional organizations in psychology after rising to prominence in the 1970s (i.e., Tracy et al., 2005). However, Mahoney (1977a), a leading CBT pioneer warns us "Although cognitive-behavioral approaches have now earned substantial recognition...perhaps the greatest problem facing cognitive therapy researchers is the tendency of confirmatory bias – i.e., selective reporting, emphasis, and publication of studies which "support" cognitive hypotheses" (p. 5).

Prevailing controversy regarding EMDR therapy

Since coming onto the scene 18-years ago, EMDR has been mired in a 'controversy' between hardened antagonists and proponents of EMDR. EMDR appears to elicit three reactions from researchers, providers and the media alike: (1) uncritical-over-zealous acceptance, (2) appropriate skepticism-with an open-mind, or (3) overly critical-defensive posturing. Unfortunately, premature and irresponsible promotion of EMDR as a proven, 'miraculous' treatment for PTSD and any number of psychiatric conditions has significantly contributed to the scientific backlash (i.e., Herbert et al., 2000). However, with substantial empirical evidence now supporting EMDR as EBT-PTSD, arguments have shifted to proving hypothesized mechanisms of action such as alternating eye movements. Research isolating eye movements has proven inconclusive (i.e., Bisson & Andrew, 2007) leading numerous CBT scholars to proclaim EMDR as merely another CBT variant (i.e., Foa & Meadows, 1997). However, if EMDR is conceptualized as a CBT variant, this contradicts the need for devaluing a kindred evidenced-based CBT as 'mesmerism' (McNally, 1999b), 'crazy therapy' (Singer & Lalich, 1996); 'pseudo-science' (i.e., Herbert et al., 2000), or 'power therapy' (i.e., Rosen, Lohr, McNally, & Herbert, 1998).

In fact, more scholarly reviews have been published on the CBT-EMDR debate itself (i.e., Baldwin, 1997; Perkins & Rouanzoin, 2002; Sikes & Sikes, 2003 and at least 22 others) then the sum total of five known PTSD treatment studies involving active-duty military personnel (Russell, 2006, 2008; Russell, Silver, Rogers, & Darnell, 2007; Schnurr et al., 2007; Spira et al., 2006), suggesting priorities are askew.

Nevertheless, assuming EMDR is genuinely regarded by impartial federally funded research and military healthcare agencies as modified-CBT with EBT-PTSD status, then there should be ample evidence of availability in training, utilization and research in agencies such as US Department of Defense, particularly during a time of war. Russell and Friedberg (submitted for publication) examined accessibility of EMDR to military personnel. Despite Department of Veterans' Affairs/Department of Defense clinical practice guidelines-PTSD, meta-analyses (including two meta-analytic comparisons with CBT (Bisson et al., 2007; Seidler & Wagner, 2006)), a National Institute of Mental Health sponsored randomized clinical trial reporting EMDR as more effective than Prozac (van der Kolk et al., 2007),

5-neuroimaging case studies (Bossini, Faiolini, & Castrogiovanni, 2007; Lamprecht et al., 2004; Lansing, Amen, Hanks, & Rudy, 2005; Levin, Lazrove, & van der Kolk, 1999; Oh & Choi, 2004) and peer-refereed articles demonstrating efficacy in military settings (Russell, 2006, 2008, in press; Russell et al., 2007; Silver, Rogers, & Russell, 2008) EMDR training and treatment are inexplicably limited (Russell & Friedberg, submitted for publication).

Clinical trainings in the US Department of Defense by Veterans' Affairs National Center-PTSD and Department of Defense's Uniformed Services University of Health Sciences and Center for Deployment Psychology all exclude EMDR trainings in favor of CBT (Russell & Friedberg, submitted for publication). Access to EMDR training is only available through individual efforts within Department of Defense and Department of Veterans' Affairs (Russell & Friedberg, submitted for publication). EMDR research has also been conspicuously neglected by military medicine (Russell & Friedberg, submitted for publication). For example, a 28 March, 2008 keyword search of the Department of Defense's Deploy-Med Research Link database resulted in 647 references found for Cognitive Therapy, 526 for CBT, 368 for Exposure Therapy, 111 for virtual reality therapy and 61 for cognitive-processing therapy, but 0 for EMDR (www.deploymentlink.osd.mil/deploymed). None of the 13 current PTSD investigations in the Department of Defense involve EMDR but include acupuncture and yoga, neither or which are EBT-PTSD (Russell & Friedberg, submitted for publication). There is an identical research bias found at National Institutes of Mental Health and National Center-PTSD (Russell & Friedberg, submitted for publication).

In sum, rationalizations to limit primary research, training and use of EMDR often invoke the 'controversy' issue despite the Department of Veterans' Affairs/Department of Defense's own clinical practice guidelines-begging the question: when does opposition to new ideas and change lose its necessary protective function and become the antithesis of scientific query and ethical practice?

Purpose of the present study

Barber (1961) identified various sources of resistance by scientists to accepting challenges to prevailing theoretical views. The current paper will examine the EMDR debate according to Barber's (1961) factors related to scientific resistance to change:

- personal and cultural blinders;
- substantive concepts;
- methodological conceptions;
- religious ideology;
- professional standing;
- professional specialization;
- professional societies 'schools' and seniority.

Resistance to scientific change: human nature

According to Barber (1961), Trotter addressed the issue of human resistance to scientific discovery by stating that "the

mind delights in a static environment...change from without seems in its very essence to be repulsive and an object of fear". However, cultural and social determinants are also powerful elements of resistance to change by scientists. Barber warns that despite rigorous methods of science to counter subjective and culturally sanctioned belief systems that run counter to an objective search of scientific truths, 'cultural blinders' remain a part of our human nature, therefore, "one noble vision may exclude another, and that good scientific ideas occasionally obstruct the introduction of better ones" (Barber, 1961, p. 597).

Resistance to scientific change: substantive concepts

According to Barber (1961), the 'substantive concepts' or adopted theoretical models held by scientists provide one type of cultural resistance to discovery. For example, in his analysis of the Copernican revolution, Kuhn describes the implacable resistance of Brahe, the leading astronomer of the time, who was unwilling to change his resolute belief concerning the earth's stationary rotational status despite considerable evidence to the contrary. Brahe actively used his academic prestige to delay acceptance of the rival theory until his death. Numerous instances abound of scientific innovations blocked by prevailing antagonists, even those with important medical implications impacting the health and well-being of others such as Pasteur's fermentation process and Lister's germ theory of disease (Barber, 1961). Francis Bacon was the first to describe 'confirmatory bias' in scientists defined as a tendency to seek out, attend to, and sometimes embellish experiences that support or confirm their beliefs and ignore disconfirming findings (Mahoney, 1977a).

Psychology has enjoyed a similar history of zeitgeist opposition and resistance to scientific innovations delineated by eras dominated by certain major psychological schools of thought or theoretical models on the nature of human development, psychopathology and therapeutic change. Since the 1950s, psychological theory and psychotherapy were dominated by three major schools of thought (psychoanalysis, behaviorism, and humanism) until 1956 when a cognitive revolution in experimental psychology took over the psychology landscape (Robins et al., 1999).

Evidence of resistance to change: CBT versus EMDR

Considerable agitation occurred in 1989 when Shapiro published her initial study of 22 sufferers from traumatic stress reporting dramatic symptom improvement after a single-session of EMD an earlier variant of EMDR therapy (Shapiro, 1989). The notion of effecting behavioral change with alternating eye movements did not conform to standard exposure-based or cognitive-restructuring protocols. It was greeted with predictable skepticism by the mainstream psychology scientific community. Leading critics have openly proclaimed, "had EMDR been put forth simply as another variant of extant treatments, we suspect that much of the controversy over its efficacy and mechanism of action could have been avoided" (Lohr, Lilienfeld, Tolin, & Herbert, 1999, p. 201) squarely in-line with Barber's (1961) first culturally based factor for scientific resistance.

According to McNally (1999a), Shapiro simply modified Wolpe's (1958) systematic desensitization by "replacing progressive muscle relaxation with induced eye movements as the reciprocal inhibitor of distress" (p. 1). After Wolpe's case study of EMD revealed its promise as a PTSD treatment, the new Exposure Therapy variant gained a measure of credibility (Wolpe & Abrams, 1991). However no CBT theory adequately explained why EMD worked by asking subjects to momentarily recall a distressing event while visually tracking the therapists' left-to-right hand movements and encouraging free associations. Specifically, EMD did not utilize repetitive exposure, coping skills training or cognitive restructuring consistent with CBT models of change. In 1990, Shapiro renamed her therapy EMDR to account for information 'reprocessing' versus strictly desensitization effects (Shapiro, 2001) thereby abandoning scientifically acceptable theories of reciprocal inhibition and emotional processing in favor of an unproven neurobiologically based accelerated information processing model.

As sensationalized media and clinical reports of a single-session 'break through' therapy emerged, the scientific community responded appropriately by insisting on randomized controlled trials to prove efficacy, spurring a point-counter-point debate over methodological flaws of respective randomized controlled trials. Complaints of unfair scrutiny and professional bias by EMDR proponents echoed back when CBT advocates faced the behavioral zeitgeist. Gradually, sufficient evidence of EMDR's efficacy emerged via randomized controlled trials warranting EBT-PTSD status (i.e., US Department of Veterans' Affairs/Department of Defense, 2004).

In 2007, the Institute of Medicine was commissioned by the Department of Veterans' Affairs to re-assess PTSD treatment, resulting in the first review to conclude insufficient evidence of EMDR's efficacy (Institute of Medicine, 2007). However the Institute of Medicine's (2007) conclusions have been disputed over alleged inaccuracies in evaluation of the studies (i.e., Lee & Schubert, in press) which stand in contrast to expert guidelines developed by US Department of Veterans' Affairs/Department of Defense (2004), APA (2004), Israeli National Mental Health Council (Bleich, Kotler, Kutz, & Shalev, 2002), Clinical Resource Efficiency Support Team of the Northern Ireland Department of Health, Social Services and Public Safety (CREST, 2003), Dutch National Steering Committee for Mental Health Care (2003), International Association for Traumatic Stress Studies (Foa, Keane, & Friedman, 2000), French National Institute of Health and Medical Research (INSERM, 2004), Medical Program Committee of Stockholm (Sjöblom et al., 2003), United Kingdom Department of Health (2001), National Institute for Clinical Excellence (NICE, 2005) and the International Cochrane Review (Bisson & Andrew, 2007). Recent outlier excluded (Institute of Medicine, 2007), EMDR skeptics can no longer argue about efficacy. This has shifted the debate to hypothesized active mechanisms, namely eye movements.

Evidence of resistance based on EMDR dismantling studies

Shapiro's (2001) reliance on a nonfalsifiable neurobiological model of EMDR that is continually modified in

the context of disparate research findings (i.e., positing alternating sounds and kinesthetic sensations are also EMDR) has drawn the ire of antagonists: “In the world of paleontology, such mutations of the fossil record would cause widespread alarm” (Devilly, 2002, p. 134). According to EMDR’s harshest critics, lack of empirical support for the contribution of eye movements to clinical outcome is sufficient grounds to discard the therapy (i.e., McNally, 1999b; Rosen & Davison, 2003). However, impartial reviews of EMDR dismantling studies determined that the findings were inconclusive (i.e., APA, 2004; Bisson & Andrew, 2007; Department of Veterans’ Affairs/Department of Defense, 2004) therefore absolute statements either confirming or disconfirming reflect confirmatory bias.

A subsequent dismantling study provided some preliminary evidence that alternating stimulation other than eye movements may be effective (i.e., Servan-Schreiber, Schooler, Dew, Carter, & Bartone, 2006). Additionally, maintaining a ‘dual-focused’ attention as characterized by requiring clients to divide their attention between self-focus (i.e., imaging a traumatic scene, or thinking a negative cognition) and an external focus (i.e., tracking alternating stimulation) is a key theoretical component of EMDR (Shapiro, 2001) that only recently has been investigated (i.e., Lee, Taylor, & Drummond, 2006). This may call into question the wisdom of prematurely eliminating any proven EBT-PTSD on theoretical grounds.

EMDR is not unique in having problems with support for hypothesized treatment components; dismantling issues regarding CBT are also unresolved (Baskin, Tierney, Minami, & Wampold, 2003; DeRubeis et al., 1990). According to Kazdin (2005), “Perhaps the most neglected question in therapy research is the mechanisms by which treatment leads to change. For even our most well-studied, evidence-based treatments (e.g., cognitive therapy for depression) we do not know why the treatment works (i.e., through what process)” (p. 186). For example, recent meta-analysis of 21 randomized controlled trials examined psychotherapy specificity comparing hypothesized active ingredients of CBT, EMDR and other therapies beyond ‘common factors’ of therapy (i.e., therapeutic relationship) with placebo controls (Baskin et al., 2003). Comparisons between active treatments and ‘structurally inequivalent’ placebos (poor resemblances of therapy) produced larger treatment effects than comparisons between active therapies and ‘structurally equivalent’ placebos (adequate resemblances of therapy) with the later contrast indicating that specific treatments were not demonstrably superior to well-designed placebos or other therapies (Baskin et al., 2003). In other words, 30 years after ascension to scientific prominence, purported mechanisms of CBT paradigm have yet to be proven as more efficacious than rival psychotherapeutic models or well-designed placebo controls.

In summary, there is ample evidence that resistance to EMDR has been extensively fueled by challenging the dominant substantive CBT concepts, as best summarized by Terrence Keane, a distinguished Veterans’ Affairs PTSD-expert who candidly offers, “The primary weakness of EMDR stems from a distinct lack of integration with existing models of psychopathology and psychotherapy” (Keane, 1998, p. 404), although this weakness may prove to be an unexplored strength.

Resistance to change: methodological conceptions

For Barber (1961), sources of scientific resistance based on methodological conceptions come in many forms, including bias toward the scientific methodology as either anti-theoretical, based on qualitative data gleaned from intuition or the opposite bias that the only acceptable scientific evidence is measurable and obtained through the senses. In regards to psychotherapy zeitgeist, heated opposition ensued between qualitative analysis of case studies used in psychodynamic and humanistic models and quantitative fervor pursued by behavioral and cognitive therapies.

Evidence of resistance to EMDR based on differing methodological theory

Rosen and Davison (2003) argue that EBT status requires empirical support of theoretical explanations or how psychotherapies work versus the complimentary, yet competing role of proving treatment efficacy, disavowing any further scientific inquiry into this EBT-PTSD because the efficacy of eye movements is unproven. It may not logically follow that only psychotherapies with proven theoretical models qualify as EBT. For instance, while many hypotheses exist to explain why Wolpe’s (1958) systematic desensitization works (reciprocal inhibition, two-factor model, self-efficacy, emotional processing, neural connectionism) none are empirically proven (Tryon, 2005).

Moreover, reviews of existing biological, psychodynamic, behavioral, cognitive, and information processing models of PTSD found all models to be theoretically and empirically deficient (i.e., Brewin, Dalgleish, & Joseph, 1996; Tryon, 2005). Therefore, pending accurate neuroscientific models of psychopathology and human change processes, determining treatment efficacy should remain a primary consideration as theories are refined.

Resistance to EMDR based on difference in conceptual model

Another source of methodologically based resistance to change is the tendency of scientists to think in terms of established models, indeed to reject propositions because they cannot be explained by prevailing theory (Barber, 1961). For example, Barber (1961) describes how Ampere’s theory of magnetic currents was resisted because others could not accept Ampere’s premise that atoms of a Newtonian model had electrical properties causing magnetic phenomena.

Evidence of resistance to EMDR based on inability to fit into acceptable models

Opponents assert EMDR is a copy of existing CBT therefore warranting no further scientific investigation (i.e., McNally, 1999a; Ost, 2006), yet new non-EBT-CBT like virtual reality (Spira et al., 2006) and cognitive-processing therapy (Monson et al., 2006; Schnurr et al., 2007) are heavily researched in Veteran’s Affairs/Department of Defense (Russell & Friedberg, submitted for publication).

Some dismiss EMDR as another form of Exposure Therapy (i.e., Herbert et al., 2000; McNally, 1999a). However unlike prolonged exposure, EMDR subjects do not repetitively use 'trauma scripts' detailing traumatic events or practice hours of relaxation to habituate conditioned fear-reactions. Instead subjects maintain a 'dual' focus of attention following free associations to untargeted traumata until subjects report the absence of change. Only then are subjects typically asked to recall the initially targeted traumatic scene. Thus EMDR appears to provide exceptionally poor Exposure Therapy. For instance, it violates principles of corrective emotional processing hypothesized to occur through compelling excessive repetition of attention to specific traumatic events and prohibiting escape or avoidance behaviors (i.e., Foa & Kozak, 1986).

Others profess EMDR to be another Cognitive Therapy variant because it solicits the subject's adaptive and maladaptive cognitions (Herbert et al., 2000). However, in EMDR there is no rational disputation, use of thought records to prove dysfunctional beliefs, instruction on combating cognitive distortions, hours of teaching self-coping skills and homework assignments. Therefore EMDR is extremely sloppy Cognitive Therapy not expected to yield much benefit. If EMDR does not utilize prolonged exposure, cognitive retraining and so on, what does happen?

In standard EMDR, clients focus their attention on disturbing aspect(s) of a distressful or traumatic memory (i.e., image, cognition, emotion, somatic sensation) or any combination(s) thereof and simultaneously concentrate on alternating, external bilateral stimulation (i.e., visually tracking a light). Subjects are instructed to 'just be aware of any associations that may arise. After brief bilateral stimulation, a here-and-now self-report is solicited. If subjects report any change from their previous association, they are asked to attend to the new internal stimuli along with further bilateral stimulation. Typically this continues until self-reports become adaptive with corresponding reduction in emotional distress when the targeted (initial) memory is re-assessed (Shapiro, 2001). Similar outcomes occur with CBT and other therapies, but the means to the ends are obviously different.

Lastly, multitudes of CBT variants exist by repackaging techniques including military medicine's embrace of 'virtual reality therapy' using expensive computer technology to deliver prolonged exposure developed in the 1950s (Spira et al., 2006). EMDR's unorthodox delivery method (i.e., inert eye movements) should be similarly endorsed as another CBT tool, particularly since no EBT is universally curative (Department of Veterans' Affairs/Department of Defense, 2004). A vast literature demonstrates EMDR may be a generally well-tolerated and effective (regardless of unsettled dismantling studies) EBT-PTSD with potential for rapid, simultaneous treatments of co-morbid psychophysical conditions (i.e., Russell, 2008). In addition, EMDR does not require hours of in-session coping skills practice, compliance with homework assignments, or extensive self-disclosure – all of which may be conducive in military settings. Consequently, reasonable person(s) might expect EMDR would be a high priority for federally funded researchers with military medicine eager to explore the possibility of a potentially rapid, efficient and

cost-effective CBT for post-war disorders. The fact EMDR research has conversely been neglected signifies undue resistance (Russell & Friedberg, submitted for publication).

Resistance to change: methodological bias toward mathematics

A third source of resistance based on methodological bias is the extent to which statistical analysis is deemed essential to validate scientific discoveries (Barber, 1961). Historical examples include Faraday's experiments with electromagnetism which were initially rejected because of the absence of mathematical proofs, while conversely Mendel's discovery of genetic inheritance was scorned because of prejudice against mathematics.

Evidence of resistance toward EMDR based on methods of analysis

Both sides of the EMDR debate attempt to adhere to constantly evolving 'gold,' 'revised-gold,' and 'platinum' standards to critique methodological rigor (Hertlein & Ricci, 2004). While universal standards are beneficial, devising 'platinum' criteria for the stated purpose of "comprehensive evaluation standard for EMDR effectiveness studies" (Hertlein & Ricci, 2004, p. 287) can ensure scientific integrity or sustaining confirmatory bias, just as advocating separate standards by EMDR proponents can keep EMDR apart from the mainstream.

Resistance to change: religious ideas

Most studies mentioning zeitgeist as posing resistance to scientific discoveries conjure up images of Galileo's and Darwin's plights when their espoused views strongly ran counter to prevailing religious tenets. The EMDR debate is not driven by religious factors.

Resistance to change: professional standing

Barber (1961) identified several social sources of resistance to scientific innovations pertaining to the relative professional status of the discoverer with "individuals of lower standing resisted by scientists of higher standing partly because of the authority the higher position provides" (p. 600). Historical examples include rejection of Abel's mathematical equation of the fifth degree, Ohm's experiments and of course Mendel, an obscure monk, all whom espoused alternate scientific beliefs to pre-eminent scientists of their time (Barber, 1961). Scientists held in high standing typically sit in judgment on the work of lesser accomplished individuals or alternative viewpoints, controlling publishing in professional journals (Barber, 1961). An empirical analysis confirmed the controlling effects of psychological schools of thought on flagship journals, noting the overwhelming power predominant CBT paradigm employs in mainstream psychology (Mahoney, 1977b; Tracy et al., 2005).

Evidence of resistance to EMDR on basis of professional standing

A degree of resistance to EMDR is due to Shapiro's lack of professional standing: "the therapy was discovered by therapist Dr Francine Shapiro, while on a walk in the park. (Her doctorate was earned at a now defunct and never accredited Professional School of Psychological Studies. Her undergraduate degree is in English literature.)" (Carroll, <http://skepdic.com>). Resistance is further evident in the derision aimed at Shapiro's claim of serendipitous discovery in comments like: "Both Mesmer and Shapiro had their therapeutic epiphanies while walking outdoors" (McNally, 1999b, p. 227).

In addition, considerable opposition to EMDR has arisen in response to its sudden rise in popularity, and the enthusiastic but unproven suggestion that EMDR is effective in treating a broad range of conditions, including ADHD and personality disorders. EMDR has thus become the target of legitimate criticisms concerning over-promotion and marketing that outstrips empirical support and results in its being labeled as 'pseudo-science' (see Devilly, 2002).

However, EMDR's information processing model extends to psychopathologies beyond PTSD similar to CBT paradigms (Shapiro, 2001). Therefore, resistance based on EMDR proliferation may shed light onto broader opposition, hinting at possible turf-wars. Resistance due to territorial threat is suggestive by comments such as: "Given that the only active component of EMDR is already part of successful intervention for PTSD (e.g., CBT) it would seem more appropriate to focus research and training resources on improving these established interventions, rather than on EMDR" (Ost, 2006, p. 5). The sentiment is echoed by a renown VA researcher with the National Center for PTSD that "EMDR is distinguished from traditional desensitization treatments by its addition of induced eye movements to imaginal exposure, and if the defining element of EMDR is therapeutically inert, then there is little reason to investigate EMDR quo EMDR" (McNally, 1999a, p. 3).

In other words, scientist-practitioners are advised to disavow further scientific interest in an EBT-PTSD producing similar therapeutic ends despite violating bedrock CBT principles using an 'inert' means (i.e., eye movements) in generally less time and without hours of teaching self-coping skills, repetitive prolonged exposure, extensive self-disclosure, homework assignments, cognitive disputation, expensive virtual reality equipment or separate protocols for co-morbidity. Instead of fostering intense scientific inquiry into blatant contradictions between EMDR and CBT, potentially leading to future therapeutic breakthroughs, EMDR is rejected as 'pseudo-science.'

Resistance to change: professional specialization

Another source of social resistance to change is the tendency of science to specialize, concentrating specific knowledge where needed. According to Barber (1961) "occasionally the negative aspect of specialization shows itself, and innovative 'outsiders' to a field of specialization are resisted by the insiders" (p. 600). Many instances exist

in medicine whereby critical discoveries were resisted by medical specialists when the source of innovation was from an outsider. For example, Pasteur met hostile resistance from physicians of his time when advancing his germ theory, "for the medical men thought of him as a mere chemist poaching on their scientific preserves, not worthy of their attention" (Barber, 1961, p. 600).

Evidence of resistance to EMDR based on professional specialization

Abruptly in 1989, an outsider publishes a doctoral thesis based on a one-session experimental discovery gleaned from a walk in a park at a now defunct graduate school. Virtually overnight Shapiro and EMDR leap onto center-stage, threatening bedrock scientific 'truths' of therapeutic change and lifetime achievements, exacerbated by sensational and premature claims of the efficacy superiority of EMDR. It would be an understandable human reaction as outlined by Barber (1961) for scientists to resent, ignore and attack an outside innovator who had not paid their dues and earned the right to challenge.

Resistance to change: societies, "schools" and seniority

Scientific organizations serve important functions for members and professions, including scientific publications essential for communication in science. However, these same professional organizations can inadvertently maintain a particular zeitgeist by filtering information published in flagship periodicals or endorsed in practice guidelines. Barber (1961) states that professional rivalries or 'schools' can offer useful competition as well as scientific resistance. That the older resist the younger in science is familiar pattern noted by scientists as far back as Bacon: "scientia inflat, and the dignitaries who hold high honors for past accomplishments do not usually like to see the current of progress rush too rapidly out of their reach" (Barber, 1961, p. 601). Mahoney (1977b) found substantial evidence that reviewers made more positive appraisals of manuscripts whose findings confirmed principles of behavioral therapy and more negative appraisals for identical manuscripts reporting findings that disconfirmed the same principles: an entrenched zeitgeist may well create publication prejudices.

Evidence of resistance to EMDR based on societies, "schools," and seniority

Criticism over EMDR training, marketing and organizations (see Herbert et al., 2000) reveals another source of resistance by mainstream psychology. Specifically, the dissemination of EMDR training is described as 'proprietary' in nature in that commercially marketed and empirically untested two-part trainings were required by Shapiro prior to establishing EMDR's efficacy. The requirement that researchers attend sanctioned EMDR trainings in order to avoid future criticism concerning negative findings and the prohibition preventing trainees from teaching EMDR strengthened resistance (i.e., Herbert et al., 2000). Then

when the EMDR International Association (EMDRIA) established empirically untested standards for practitioners to become certified EMDR therapists, consultants, and trainers, this move was perceived as resulting in further financial benefits to EMDR professionals or organizations, and it contributed to further charges of ‘pseudo-science’ (i.e., Lohr & Fowler, 2002).

According to Shapiro (2001), EMDR training standards and the EMDR International Association ensure quality control, client safety and the continuing education of clinicians. An objective appraisal of EMDR trainings reveals credence to declaring insufficient empirical support for training length and certification requirements. In fairness, several national CBT organizations also market trainings and establish certification standards without empirical validation (i.e., Center for Cognitive Therapy). Moreover, mainstream CBT workshops, conferences and trainings are plentiful nation-wide with presenters making a living on speaking-circuits selling CBT books, training manuals and videotapes flooding the market. However, profitable commercial enterprises sanctioned by psychology’s major professional societies appear to be above accusations of ‘pseudo-science,’ suggesting a double-standard.

Discussion

This analysis examined reasons for sustained resistance to training, utilization and research of an identified EBT-PTSD within federal research and healthcare institutions, especially military and veteran’s agencies. That much is gained from the prominent CBT paradigm is beyond question. However, when rigidity and dogma take over, science becomes blinded by self-imposed intellectual limitations geared to seeing what is expected and rejecting the rest. Innovative ideas challenging the prevailing paradigm are ignored, ridiculed and discarded. Barber (1961) and others who have analyzed the progression of science indicate that resistance and opposition to scientific discovery is a natural and critical process. That EMDR advocates complain of ‘unfair’ or ‘biased’ scrutiny by the prominent CBT zeitgeist is understandable, inevitable and exacerbated by self-defeating actions of misguided EMDR proponents, because the burden of proof is always on the challenger.

However, maladaptive resistance toward EMDR is clearly evident within federal, academic and scientific agencies, particularly in the military. Failure to suitably research, train and utilize any EBT-PTSD, especially during a time of war, because it does not conform to dominant or preferred psychotherapy models, or emphasizing theory over efficacy, ultimately restricts scientific discovery and combat veteran access to all best current and future treatments.

Conclusions

The intense scrutiny, skepticism and resistance to accepting EMDR is expected and critically necessary, especially given its non-traditional introduction and serious missteps by EMDR proponents. However, there is no longer credible scientific debate or ‘controversy’ about

the efficacy of EMDR and the literature on EBT-PTSD firmly demonstrates that there are no universal panaceas. Therefore continued resistance to fully researching, training and using EMDR does not serve the best interest of science and beneficiaries, predominantly combat veterans.

In order to bridge the scientific socio-cultural impasse, a Sherifian super-ordinate goal is offered (Sherif & Sherif, 1966) calling for an all out, good-faith, impartial scientific effort to develop, train and utilize the most effective psychotherapies available, regardless of theoretical orientation, with a mutual aspiration of improving our understanding of how to efficiently prevent and treat exposure to traumatic stress, particularly in those sent into harm’s way.

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