

Traumatology

<http://tmt.sagepub.com>

Somatic Experiencing Treatment With Tsunami Survivors in Thailand: Broadening the Scope of Early Intervention

M. Laurie Leitch

Traumatology 2007; 13; 11

DOI: 10.1177/1534765607305439

The online version of this article can be found at:
<http://tmt.sagepub.com/cgi/content/abstract/13/3/11>

Published by:

 SAGE Publications

<http://www.sagepublications.com>

Additional services and information for *Traumatology* can be found at:

Email Alerts: <http://tmt.sagepub.com/cgi/alerts>

Subscriptions: <http://tmt.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations (this article cites 32 articles hosted on the SAGE Journals Online and HighWire Press platforms):
<http://tmt.sagepub.com/cgi/content/refs/13/3/11>

Somatic Experiencing Treatment With Tsunami Survivors in Thailand: Broadening the Scope of Early Intervention

M. Laurie Leitch

This exploratory study examines the treatment effects of brief (1 to 2 sessions) Somatic Experiencing with 53 adult and child survivors of the 2004 tsunami in Thailand. Somatic Experiencing's early-intervention model, now called Trauma First Aide, was provided 1 month after the tsunami. Survivor assessments were done pretreatment, immediately posttreatment, 3 to 5 days posttreatment, and at the 1-year follow-up. Results indicate that immediately following treatment, 67% of participants had partial to complete improvement in reported symptoms and 95% had complete or partial improvement in observed symptoms. At the 1-year

follow-up, 90% of participants had complete or partial improvement in reported symptoms, and 96% had complete or partial improvement in initially observed symptoms. Given the small sample size and lack of an equivalent comparison group, results must be interpreted with caution. Nonetheless, the results suggest that integrative mind–body interventions have promise in disaster treatment.

Keywords: mind–body psychotherapy; disaster; tsunami; cross-cultural research; Somatic Experiencing; Trauma First Aide; integrative treatment; brief treatment

On December 26, 2004, an underwater earthquake caused a deadly tsunami, the aftermath of which had a catastrophic effect on Indonesia, India, Sri Lanka, and Thailand and affected other countries as well. In southern Thailand, all of the provinces bordering the Andaman Sea suffered death and destruction, some more than others. With more than 4,200 deaths and thousands traumatized and displaced because of the destruction of their homes and villages, Phang Nga province was the most heavily damaged of the southern provinces.

At the end of January 2005, 1 month after the tsunami, a team of nine North American clinicians affiliated with the Foundation for Human Enrichment (a trauma training center based in Colorado) traveled to Phang Nga province in southern Thailand. The team was sponsored by the counseling department of a Bangkok university and traveled with the Thai

Princess's Mobile Medical Unit. The clinicians had been asked to provide information to local caregivers on topics such as normal responses to trauma, coping strategies after catastrophic events, and posttraumatic stress disorder (PTSD) in adults and children. They were also asked to bring the brief stabilization model (now called Trauma First Aide [TFA], derived from Somatic Experiencing [SE]) to schools and evacuation camps.

SE is an integrative, mind–body trauma treatment developed by Peter A. Levine (1996) that focuses on the resolution of posttraumatic-stress activation through re-establishing self-regulation. Because trauma begins with a conditioned response, it is important to extinguish the conditioned associations (Scaer, 2006). In Somatic Experiencing, this is accomplished by identifying and restructuring motoric and other psychophysiological patterns that underlie a wide variety of traumatic responses. Using sensorimotor processing to restructure trauma-based psychophysiological patterns, SE links somatic with emotional and cognitive processing to help the mind–body system disentangle traumatic linkages

From the Foundation for Human Enrichment, Niwot, Colorado.

Address correspondence to: Laurie Leitch, Foundation for Human Enrichment, 7102 La Vista Place, Niwot, CO 80503; e-mail: l.leitch@comcast.net.

and regain its built-in capacity for self-regulation (Levine, 1997). TFA is the brief, early-intervention form of SE used in disaster mental-health and emergency settings (Miller-Karas & Everett, 2005).

Mental-Health Effects of Trauma and Disaster

When left untreated, traumatic-stress reactions have been found to lead to long-term mental-health effects (Bland, O'Leary, Farinero, Fabrizio, & Trevisan, 1996; Bower & Sivers, 1998; Brady, Killeen, Brewenton, & Lucerini, 2000; Bravo, Rubio-Stipec, Woodbury, & Ribera, 1990; Mayou, Bryant, & Ehlers, 2001; Tucker, Dickson, Pfefferbaum, McDonald, & Allen, 1997). Kessler, Sonnega, Bromet, Hughes, and Nelson (1995) found that even after many years, symptoms from a traumatic event were still present and did not spontaneously remit. In addition, studies have found that levels of symptoms early in the postdisaster period are predictive of later symptomatology (Norris, 2001).

Carr et al. (1997) describe two sets of psychological consequences that arise from a disaster: threat effects and disruption effects. Their study highlights the fact that natural disasters are not circumscribed events with a defined endpoint. The disruption effects—including ongoing exposure to devastation, property loss, displacement, fragmentation of families, and financial stress—often last for years, having the potential to keep survivors in high states of arousal and hopelessness. Disasters that cause massive devastation as well as prolonged community and economic disruption have been termed “atypically strong disasters” and have been found to be accompanied by severe or very severe individual-level impairment (Norris, 2001). Atypically strong disasters such as the tsunami are likely to require multimodal approaches (Lerner, 2005). Not surprisingly, trauma exposure has been found to be the most reliable predictor of PTSD (Norris, Murphy, Baker, & Perilla, 2004).

Methodological Issues in Assessing Disaster Populations

Natural disasters occur with little or no warning. Researchers and treatment teams must respond quickly, designing and implementing treatment and research approaches to a particular event as they head into the setting. The challenges can be especially daunting when Western teams respond to disasters

in nonindustrialized countries. The assessment process seldom uses instruments that have been evaluated for cultural equivalence (Flaherty et al., 1988) and often contains culture-bound questions or assumptions (Bolton & Tang, 2002).

As Norris (2006) points out, rapidly assessed samples, such as with survivors of natural disasters, are more likely to be selected for reasons of convenience and to be small in size. They can, nevertheless, offer important information about symptom profiles of survivors, indications of promising treatment approaches, and understudied populations. Although rapid assessment is important postdisaster, cross-cultural training should be part of the response team's preparation when intervening in other cultures. This ensures that factors such as caste hierarchies, ethnic-group membership, and local leadership are approached with sensitivity (Fernando, 2005).

Cross-Cultural Issues in Disaster Response

There is much controversy about if and when Western-developed interventions are appropriate for use in non-Western countries and cultures that have experienced a disaster. The controversy is well justified. Interventions designed to alleviate traumatic stress have not demonstrated consistently positive results even with the populations for whom they were designed. Eye-movement desensitization and reprocessing (EMDR) and cognitive behavioral therapy (CBT) appear to have the most consistently positive treatment effects. Methodological differences across studies make comparison of effects difficult. There is little comparability in trauma studies as to the timing of interventions and little if any theoretical discussion or empirical comparison regarding the appropriate timing of interventions.

In their discussion of the need for rapid mental-health assessments after disasters in nonindustrialized countries, Silove and Bryant (2006) point out that psychological trauma is a Western concept. They list a number of issues that must be considered when Westerners attempt to provide mental-health services to survivors of disasters in nonindustrialized countries (p. 576):

1. Meaning ascribed to experiences and “symptoms” may differ across cultures.
2. Many cultures do not have equivalent terms for PTSD symptom domains.

3. Disaster-affected communities may not prioritize psychological distress.
4. A PTSD diagnosis may encourage a culture of "victimhood" and passivity.
5. Traumatic stress symptoms may be normative coping mechanisms and may not lead to impairment.
6. Emphasis on PTSD may encourage an individual and clinical focus in cultures that are community focused.
7. Evidence is limited that Western treatments for PTSD are effective across cultures.
8. Imported Western techniques may undermine traditional healing mechanisms.
9. Attention to social, material, economic, and human rights issues may be more critical in facilitating natural recovery at a group level.
10. An emphasis on PTSD may obscure other pressing mental-health needs.

Unfortunately, until recently, the tendency of Western countries and practitioners to approach mental health in a way that splits the mind and the body has been firmly entrenched and makes many Western trauma interventions inappropriate in other cultures and nonindustrialized countries. Traditional mental-health interventions approach trauma from the "top down," focusing on talk, insight, and emotions. These top-down approaches are likely to have limited relevance in diverse cultures in which group and community have primacy over the individual and in which insight-oriented interventions are not syntonetic with cultural norms. "Bottom-up" approaches are less culture specific because of their focus on biological responses that are common to all humans.

Mind–Body Intervention

The term *mental health* perpetuates an orientation to psychological and emotional symptoms that result from a traumatic event at the risk of neglecting somatic responses to threat that are instinctive and biological. A review of the intervention literature for studies using integrative (mind–body) approaches yielded no studies in peer-reviewed journals. Although trauma literature typically includes both physical and psychological symptoms in examination of treatment outcomes, mental-health interventions themselves seldom explicitly target physical symptoms and autonomic responses to threat.

The lack of interventions that focus on the body is striking, given that many statistically sound studies

show that an array of somatic symptoms results from untreated traumatic stress. The somatic symptoms include changes in brain volume (Bevans, Cerbone, & Overstreet, 2005); loss of bowel and bladder control (Lehman, 1985; Solomon, Laor, & McFarlane, 1996); shaking, trembling, and increased heart rate (Bernat, Ronfeldt, & Calhoun, 1998; Resnick, 1997; Shalev et al., 1998); myofascial pain (Scaer, 2006); diabetes (Golden, Williams, & Ford, 2004); heart disease (Musselman & Nemeroff, 2000); and a continuum of stress-related diseases (Green, Grace, & Glesser, 1985; Scaer, 2006) and immune-system disorders (Gunnar & Vazquez, 2001; McEwen, 1998; Sapolsky, 1994). It is becoming increasingly evident that traumatic events can result in long-term alterations in the endocrine, autonomic, and central nervous systems (Friedman, Charney, & Deutch, 1995).

Researchers are increasingly using physiological monitoring to examine how the autonomic nervous system responds to traumatic events (Bryant, Harvey, Guthrie, & Moulds, 2000; Griffin, Resick, & Mechanic, 1997; Orr, Metzger, Miller, & Kaloupek, 2004). The Griffin et al. study found that when highly dissociative rape victims were verbally describing their rapes, there was a significant suppression of autonomic reactivity. In a study of assault victims, Bryant et al. found that elevated activation of the sympathetic nervous system was associated with later development of PTSD. These studies highlight the importance of trauma-intervention approaches that attend to the cascade of physiological, not just psychological, responses that can follow traumatic events. They help bring attention to the need for trauma interventions that go beyond the dichotomy of mind and body, particularly interventions that specifically target the way posttraumatic responses have been stored or patterned in the body and that restore self-regulatory functioning.

Early Intervention

Early intervention that uses a brief treatment model is well suited to natural-disaster settings. Efficiency is an important concept in treatment (Greenwald, 2005). Low-dosage interventions that are able to have a positive effect are more cost effective and deliver relief to survivors more quickly. There is debate as to whether interventions should be provided early in a disaster's aftermath, as many survivors' symptoms remit without intervention as time goes by. In a study of flood victims in Mexico (Norris

et al., 2004), results indicated that PTSD symptoms dropped by 50% in the first 18 months after the flood. However, between 18 and 24 months postdisaster, no further decreases occurred. It is possible that early intervention may accelerate natural recovery (Foa, Zoellner, & Feeny, 2006).

Only one natural disaster intervention study was located that used a brief (one- to two-session) early-intervention approach. It was conducted in the United States. A study of EMDR's effectiveness with survivors of Hurricane Andrew (Grainger, Levin, Allyn-Byrd, Doctor, & Lee, 1997) provided one to two sessions of EMDR treatment 10 to 14 weeks after the hurricane. Adults who received EMDR treatment had significant reductions in PTSD symptoms compared to a wait-list group.

Procedure

Clinicians

The primary purpose of the team's work in Thailand was to provide orientation and training about the somatic basis of trauma to groups of local caregivers (e.g., teachers, university psychology students, administrators, and the Thai Red Cross). In addition, during the team's month-long stay (from January 30 through February 28, 2005), individual SE/TFA treatment was provided to 53 adults and children. All nine team members were affiliated with the Foundation for Human Enrichment's (FHE) Trauma Outreach Program and had completed or were in the final stages of completing the 3-year training program in SE. The SE training program includes required individual SE treatment sessions and case consultation for trainees. The team included one faculty member who was available to provide case consultation to promote treatment quality and integrity.

Assessment Protocol

An assessment form was developed that was appropriate for use with people in high states of arousal. This assessment form, in addition to collecting demographic data, asked the survivors to report their three main symptoms of concern. By asking this open-ended question, we hoped to collect culture-specific information about symptoms. The clinicians also recorded the three main observable symptoms (e.g., quality of affect, face and skin coloration, posture, muscle tone, etc.). Observable symptoms

are used in SE/TFA treatment to assess nervous-system functioning as well as to track the body's sensory patterns during treatment.

At the end of the SE/TFA session, each survivor was asked to describe the status of the symptoms that had been reported at intake. This information was recorded by the clinician as no change, partial improvement, completely improved, or unable to assess immediately posttreatment (e.g., appetite problems). The clinicians also rated the observed symptoms at the end of the session using the same format. A follow-up was done with all survivors who could be located 5 to 7 days after the SE/TFA session ($n = 16$); at this time, the reported and observed symptoms were rated again. One year after the tsunami, a team of three clinicians returned to Thailand. Of the original 53 survivors who received individual SE/TFA sessions, 22 were located and interviewed. Symptoms that had been reported and observed at intake were rated again.

Measures

Data were collected using two forms. The first was a symptom-tracking form that was developed when the team realized that the level of tsunami survivors' arousal was too high to ethically administer a standardized symptoms checklist as planned. The symptom-tracking form collected demographic information, the three main symptoms reported by the participant, and the three main symptoms observed by the clinician. The second data-collection instrument was a case-study form. During each week in Thailand, team members drafted two case studies of their individual SE/TFA treatments with tsunami survivors. The written format of the case studies was structured to incorporate the key interventions included in an SE/TFA session as well as provide in-depth narratives (qualitative data) on a subset of tsunami survivors who received treatment.

Throughout the month in Thailand, the team discussed issues that arose regarding the collection of data from survivors of a catastrophic event who are in states of high arousal. The potential for exploitation in the name of gaining expanded knowledge on trauma and treatment effectiveness was discussed. This helped the team adapt data-collection tools and processes to the population being served. Rafferty (1997) offers ethical issues that need to be addressed at each stage of inquiry. He stresses the importance of giving primary consideration to the participant and highlights the seldom-discussed

issue of possible retraumatization during the research process.

SE/TFA Intervention Protocol

SE/TFA is a structured, manual-based protocol with specific interventions that focus primarily on self-regulation (i.e., restoring equilibrium to the nervous system) and secondarily on working with associated emotions and cognitions. SE/TFA offers concrete skills to reduce hyperarousal and dysregulation, including (a) tracking shifts in the nervous system by following a survivor's report of internal sensations and by observing breathing (rapid, shallow, panting), heart rate (increase, decrease), muscle tension, shifts in posture, changes in skin color, and involuntary body movements (eyes, head, neck, shoulders, hands, legs); (b) resource use (internal and external); (c) grounding techniques; (d) pendulation (moving between states of relative organization and disorganization within the nervous system); and (e) titration (the process of gradually accessing somatic activation, body sensations, feelings, and thoughts associated with the traumatic experience so that the nervous system can adjust to each increment without becoming overwhelmed; Levine, 1997; Miller-Karas & Everett, 2005).

SE/TFA treatment involves gradually (and in increasing gradations of intensity) eliciting awareness of body sensations that are linked to the trauma, balancing each increment of traumatic arousal with a corresponding resource sensation. The individual moves between the sympathetic (arousal) and parasympathetic (calming) functions of the autonomic nervous system in a way that minimizes the risk of flooding and retraumatization and can restore the normal sympathetic–parasympathetic relationship.

Participants who receive individual SE/TFA sessions are able and are encouraged to use the concrete skills they have learned in sessions on their own, after treatment, to continue reinforcing equilibrium in the autonomic nervous system.

The rationale for this early intervention is that when individuals (adults and children) are helped to stabilize as soon as possible after a traumatic event, they will be better able to adapt to changed circumstances and advocate for themselves and will be less likely to develop chronic symptoms. This “window of opportunity” in which early, integrative intervention is hypothesized to promote a faster return to equilibrium has not yet been studied in disaster

research and is an important area for future research. The SE/TFA protocol for children follows the same general protocol as for adults (i.e., tracking, grounding, resourcing, pendulation, and titration), with emphasis on age-appropriate metaphorical movement and games to re-establish equilibrium.

SE/TFA Treatment

The individual SE/TFA sessions lasted from 40 to 60 minutes. Trained Thai translators were used when explaining and conducting treatment. Sessions were conducted in diverse settings including behind the medical tent at evacuee camps, in temporary houses in the camps, on stoops, in the village wats (Buddhist temples), in day care centers, and in schools. See Leitch (2005) for a description of the work with tsunami survivors and the issues the team confronted.

Providing treatment in a disaster setting provides challenges to confidentiality. In most cases, treatment was provided while surrounded by the participants' friends and family members, who often asked for treatment for themselves and/or family members. In some cases, an announcement was made over a loudspeaker indicating the availability of treatment. In other cases, team members and translators went door to door inquiring how the occupants were doing and offering treatment in the evacuation housing.

When treatment was provided in a wat, Buddhist monks often observed. Discussions in which the monks shared their perspectives with team members would follow treatment sessions. The monks provided team members with their Buddhist approach to working with survivor anger and guilt, fear of ghosts, the search for loved ones' bodies, and rituals for letting go. These discussions were extremely helpful in heightening clinician sensitivity to local customs, values, and survivors' coping strategies. This increased awareness was incorporated into the work wherever possible.

Few survivors refused treatment; those who refused initially often came back at a later date and requested it. The fact that treatment was usually observed by many friends and family acquainted survivors with the treatment being provided and may have led to fewer refusals.

Consultations regarding participant protections were held with the Thai university sponsor. The sponsor recommended against using a written consent form, as he said it was not the cultural norm.

Assessment forms were kept in the research coordinator's in-room hotel safe while in Thailand and in a locked file cabinet once back in the United States. At the 1-year follow-up, assessment forms solely used case identification numbers. Data-entry personnel had no access to participant names.

Participants

A total of 53 persons participated in one to two SE/TFA sessions (89% received one session, 11% received two sessions). The number of sessions received was determined solely by availability, not symptom severity. The sample was a convenience sample consisting of 9 children (ages 3 to 15) and 44 adults (ages 20 to 75). Thirty-six percent were male and 64% were female. All participants were from Phang Nga province. Thirty-six percent of the survivors were seen in evacuation housing, 31% were seen in or behind the medical tents, 21% were seen in village wats (Buddhist temples), 11% were seen at a school or day care center, and 1% were seen in Nam Kem village (which had been nearly completely destroyed, but a few residents went back each day to protect their property).

Analysis

This is an exploratory study, and the data analysis is descriptive in nature. Lack of an equivalent comparison group means that multivariate analysis was not conducted. However, univariate and bivariate analyses provided descriptive symptom profiles of the tsunami survivor sample. Univariate and bivariate analyses also provided descriptive statistics about treatment outcomes. Symptoms have been examined by gender and age. To examine treatment effects, comparisons of symptoms were made between intake and the follow-up points. Without randomization and a comparison group, the treatment outcomes can only be suggestive, but they can offer useful information about the potential of SE/TFA in the aftermath of natural disasters.

Results

Quantitative Findings

Table 1 delineates the most frequently self-reported and clinician-observed symptoms pretreatment. Physical pain was experienced (pretreatment) by almost half of the survivors. The physical symptoms experienced by survivors frequently sent them to the

Table 1. Most Common Trauma Symptoms Reported Pretreatment

Symptom	Reported Symptoms	Observed Symptoms
Physical pain	45%	
Sleep problems	30%	
Headaches	10%	
Flat affect		31%
Anxiety/agitation		28%

NOTE: Symptom changes were assessed immediately following the session, 3 to 5 days after treatment, and 1 year after treatment. These results (see Table 2) should be interpreted with caution given the small sample size. Participants were also asked at the 1-year follow-up about symptoms they had reported pretreatment. They were assessed for pretreatment observed symptoms. They were also asked about other symptoms commonly experienced by disaster survivors. Eighty-six percent reported no appetite problems, 82% reported no sleep problems, and 90% reported no nightmares. Seventy-five percent reported that they had not been on any medication since the tsunami.

medical tents, where they would receive pharmacologic intervention. Other commonly reported symptoms included worry, anxiety, and fear as well as auditory or visual flashbacks. Other observed symptoms included sadness, hypervigilance, concentration problems, muscle tension, and shallow breathing.

Differences in symptoms and improvement among participants were examined based on gender and age group. Although sample sizes are small, the following differences were found:

1. On average, females ($n = 34$) reported higher levels of physical pain compared to males ($n = 19$). For example, 50% of females reported physical pain as their first reported symptom, compared to 37% of males.
2. Females showed greater symptom improvement than males. After one SE/TFA session, an average of 71% of females showed complete or partial improvement in reported symptoms, compared to 59% of males. These findings were similar when participants were assessed 3 to 5 days after treatment and at the 1-year follow-up.
3. When survivors from different age groups were compared, those aged 40 to 49 reported the highest levels of physical pain. Specifically, 62% of symptoms among 40- to 49-year-olds could be characterized as physical pain. Other age groups (ages 3 to 15, 20 to 39, and 50 to 75) reported less physical pain.
4. Participants from different age groups showed approximately the same level of improvement after participation in SE/TFA sessions.

Qualitative Findings

The assessment collected narrative information about participants' individual experiences via the case-study form. The comments from participants detailed heart-wrenching stories of the death of family members and friends, loss of homes and fishing boats, and mounting anxiety and fear. Comments included the following.

One Month After the Tsunami

1. "His mother, sister, and grandmother died in the waves. Father was trying to hold all their hands but couldn't. He was tumbled by waves and survived by clinging to a floating refrigerator. Has been searching for grandmother's body. Sees the wave when he closes his eyes."
2. "He was a village leader. His mother died in waves, body not found. He was a fisherman. Said he'd never go back to the water. Afraid doctors will want to amputate his leg since they are doing many amputations."
3. "Family is worried he'll die because he's not eating. Described ghost in his stomach. Following the session, he said the 'ghost was gone.'"
4. "Lonely. Misses living in her village and seeing friends. Afraid another tsunami is coming."

One Year After the Tsunami

1. "Daughter (age 8) drowned. She has no other children. Lives with her mother in the village. They have rebuilt on the land where previous house was."
2. "Feels stronger, relies on her friends in the village for comfort because she knows she's not the only one afraid. Would move far away if she had the money."
3. "She lives right at the edge of the sea and was saved by clinging to a coconut tree. Now only that one tree remains. Each day she offers the tree a fresh flower."
4. "There have been at least seven false tsunami alarms. Everyone runs wildly around, some have car crashes, others fall and break bones. She walks to the school at night to sleep along with many others because it's far from the sea. Afraid to close her eyes at night for fear the waves will come."

Discussion

This exploratory, cross-cultural study is unique in its test of the effectiveness of an integrative, brief-model

SE/TFA with disaster survivors. As the literature indicates, trauma research is increasingly linking the mind and the body as more is understood about the biological basis of traumatic stress and the array of physiological symptoms arising from alterations in the endocrine, autonomic, and central nervous systems. In disaster settings, in which survivors are often difficult to locate for more than a single session, brief interventions are extremely relevant. Treatment that can be effective in low dosages is also less costly and can provide stabilization to more people in less time.

The study is an exploratory test of SE/TFA, an early-intervention model focused first on dysregulated biological responses, and second, on cognitive and emotional responses. Study results show that 67% of participants showed complete or partial improvement in reported symptoms and 95% showed complete or partial improvement in observed symptoms immediately following the session. Ninety percent of the participants who were located 3 to 5 days after their sessions ($n = 16$) showed improvement in reported symptoms, and 84% showed improvement in observed symptoms. One year after treatment, participants who were located ($n = 22$) had maintained the improvement, with 90% showing complete or partial improvement in reported symptoms and 96% showing complete or partial improvement in observed symptoms (see Table 2). Results must be interpreted with caution because of the convenience sample, lack of a comparison group, and small sample sizes at follow-up.

Strengths and Limitations

The study has the following strengths: It is a study of a population (Asian disaster survivors) that has received little attention until recently, it explores the efficacy of brief treatment and early intervention, and it tests an intervention that, although it was developed in the West, is appropriate cross-culturally because it does not rely primarily on insight and psychological orientation. Another strength of the study is SE/TFA's focus on the biological response to trauma. Trauma intervention following catastrophic events is a complex undertaking, and models that expand the levels of traumatic inquiry to include the neurophysiological have great potential.

The study's limitations are that treatment was done with a nonrandom population, there was no comparison group, and the follow-up samples are small. The limitations make it difficult to determine the full extent to which symptom improvements

Table 2. Percentage of Participants Reporting Partial or Complete Improvement of Symptoms Posttreatment

Time of Follow-up	Immediate (n = 53)	3 to 5 Days (n = 16)	1 Year (n = 22)
Reported symptoms	67%	90%	90%
Observed symptoms	95%	84%	96%

were because of the treatment or would have happened with the passage of time. It can be helpful to examine a survey of Thai tsunami survivors conducted during approximately the same time period as this study (van Griensven et al., 2006). The van Griensven et al. study, like this study, included survivors from Phang Nga province; however, it was not a treatment study. Therefore, it gives a picture of untreated Thai survivors in Phang Nga province.

The results reported by van Griensven et al. indicated that 37% of displaced survivors reported anxiety symptoms (in our study, 28% of survivors were observed at intake to be suffering from anxiety). At their 9-month follow-up survey, van Griensven et al. found that the rates of those reporting anxiety (as well as PTSD symptoms and depression) had decreased. However, the symptom rates were still elevated (24.8% reported still suffering from anxiety), whereas in our treatment sample, 96% reported complete or partial improvement at the 1-year follow-up. Comparing the results of the no-treatment sample with the treatment sample in this study offers some support that the gains reported and observed in this study may be the result of SE/TFA treatment and not merely the passage of time.

Some might also consider the lack of standardized instruments a limitation of this study. Arousal levels of many of the survivors made symptom checklists seem inappropriate, and many standardized instruments have been normed only on Western populations, which casts doubt on their validity for populations in nonindustrialized countries. This study was exploratory, and it was felt that collecting the symptoms that the survivors reported to be of most concern would better contribute to a general understanding of their distress.

Implications for Future Research and Clinical Practice

The study has several implications for future research and for clinical practice. First, it may be

that models such as SE/TFA, in which the entry point is the body, are more effective in cultures that do not place primacy on psychological symptoms and verbal processing. Studies comparing outcomes from integrative models and cognitive or emotional models are needed. There is a clear need for more research regarding the effectiveness and efficiency of SE/TFA. This study is a beginning effort.

Second, the results suggest that early intervention may promote stabilization. As the literature indicates, in large-scale natural disasters, the effects are not circumscribed to a brief period following the event; disruption effects can go on for months or years, contributing to further traumatic stress and highlighting the importance of early stabilization interventions. If survivors' traumatic symptoms can be decreased soon after a disaster, it is likely that they can be better advocates for themselves and that family and community relationships will be more stable. More research is needed that compares rates of recovery following early intervention to natural rates of recovery and explores the nature and degree of social and economic gains (at the individual and the community levels) resulting from early intervention.

Finally, approaches such as SE/TFA may reduce the number of symptomatic survivors who are put on medication following a disaster. When participants who reported physical symptoms (such as headaches, stomachaches, and limb pain) experienced improvement following a single SE/TFA session, they were far less likely to present at the medical tent. Tsunami survivors who did go to the medical tent with physical complaints were routinely put on medication.

The general lack of knowledge about pain as a symptom of trauma can lead to somatic symptoms being treated as medical problems that require pharmacologic intervention. In one evacuation camp, we saw frequent dispensing of antidepressants to survivors who went to the medical tent because of sleep problems; this included young children. Although there is a clear role for psychotropic medication for some trauma survivors, integrative interventions that target both emotional and physical symptoms may help avoid what appears to be overreliance on medication when treating traumatized disaster survivors.

SE/TFA appears to be effective as an early response. I do not know the extent to which the positive outcomes were attributed to the early nature of the intervention. Is there a "window of opportunity" in which interventions for disaster survivors are

most effective? This question points to an important direction for future research.

Integrative approaches such as SE/TFA have much to offer disaster survivors because they approach survivors holistically rather than in a dichotomized way, and they tend to draw on verbal and emotional processing only secondarily to sensorimotor processing. The bottom-up interventions are not as culture bound, drawing as they do on the neurobiological basis of traumatic response that is evidenced in an array of observable and reportable somatic states. Working at the somatic level minimizes issues such as the differential meaning that symptoms may have in non-Western countries and what is often a lack of focus on individuals' psychological functioning. Integrative techniques work with the patterns of dysregulation that generate significant risk for the development and chronicity of symptoms, whether psychological or somatic. This outlook recognizes that what manifests as a physical symptom (e.g., a stomachache) may be a traumatic response that can be alleviated by working with sensorimotor processing. What is needed in disaster treatment is a new science of disaster relief, one that gives immediate aid not just to the body or to the mind but to the two together, as inseparable parts of the whole survivor.

References

- Bernat, J. A., Ronfeldt, H. M., & Calhoun, K. S. (1998). Arias I: Prevalence of traumatic events and peritraumatic predictors of posttraumatic stress symptoms in a nonclinical sampling of college students. *Journal of Traumatic Stress, 11*, 645-665.
- Bevans, K., Cerbone, A., & Overstreet, S. (2005). Advances and future directions in the study of children's neurobiological responses to trauma and violence exposure. *Journal of Interpersonal Violence, 20*(4), 418-425.
- Bland, S., O'Leary, E., Farinero, E., Fabrizio, J., & Trevisan, M. (1996). Long term psychological effects of natural disasters. *Psychosomatic Medicine, 58*, 18-24.
- Bolton, P., & Tang, A. M. (2002). An alternative approach to cross-cultural function assessment. *Social Psychiatry Psychiatric Epidemiology, 37*, 537-543.
- Bower, G. H., & Sivers, H. (1998). Cognitive impact of traumatic events. *Development and Psychopathology, 10*, 625-653.
- Brady, K. T., Killeen, T. K., Brewenton, T., & Lucerini, S. (2000). Comorbidity of psychiatric disorders and post-traumatic disorder. *Journal of Clinical Psychiatry, 61*(Suppl. 17), 22-32.
- Bravo, M., Rubio-Stipec, M., Woodbury, M., & Ribera, J. (1990). The psychological sequelae of disaster stress prospectively and retrospectively evaluated. *American Journal of Community Psychology, 18*, 661-680.
- Bryant, R., Harvey, A., Guthrie, R., & Moulds, M. (2000). A prospective study of psychophysiological arousal, acute stress disorder, and posttraumatic stress disorder. *Journal of Abnormal Psychology, 109*, 341-344.
- Carr, V. J., Lewin, T. J., Webster, R. A., Kennedy, J. A., Hazell, P. L., & Carter, G. L. (1997). Psychosocial sequelae of the 1989 Newcastle earthquake: II. Exposure and morbidity profiles during the first 2 years post-disaster. *Psychological Medicine, 27*(1), 167-178.
- Fernando, G. (2005). Finding meaning after the tsunami disaster: Recovery and resilience in Sri Lanka. *Traumatic Stress Points, News for the International Society for Traumatic Stress Studies, 19*(1), 1-12.
- Flaherty, J., Gavira, F. M., Pathak, D., Mitchell, T., Wintrob, R., Richman, J., et al. (1988). Developing instruments for cross-cultural psychiatric research. *The Journal of Nervous and Mental Disease, 175*(5), 257-263.
- Foa, E., Zoellner, L., & Feeny, N. (2006). An evaluation of three brief programs for facilitation recovery after assault. *Journal of Traumatic Stress, 19*(1), 29-43.
- Friedman, M. J., Charney, D. S., & Deutch, A. Y. (1995). *Neurobiological and clinical consequences of stress: From normal adaptation to post-traumatic stress disorder*. Hagerstown, MD: Lippincott-Raven.
- Golden, S., Williams, J., & Ford, D. (2004). Depressive symptoms and the risk of type 2 diabetes: The atherosclerosis risk in communities study. *Diabetes Care, 27*, 429-435.
- Grainger, R. D., Levin, C., Allyn-Byrd, L., Doctor, R. M., & Lee, H. (1997). An empirical evaluation of eye movement desensitization and reprocessing (EMDR) with survivors of a natural disaster. *Journal of Traumatic Stress, 10*, 665-671.
- Green, B. L., Grace, M. C., & Glesser, G. C. (1985). Identifying survivors at risk: Long term impairment following the Beverly Hills Supper Club fire. *Journal of Consulting and Clinical Psychology, 53*, 672-678.
- Greenwald, R. (2005). Change per session: A new efficiency statistic for treatment studies. *Traumatic Stress Points, News for the International Society for Traumatic Stress Studies, 19*(1), 11.
- Griffin, M. G., Resick, P. A., & Mechanic, M. B. (1997). Objective assessment of peritraumatic dissociation: Psychophysiological indicators. *American Journal of Psychiatry, 154*, 1081-1088.
- Gunnar, M. R., & Vazquez, D. M. (2001). Low cortisol and flattening of expected daytime rhythm: Potential indices of risk in human development. *Development and Psychopathology, 13*, 515-538.
- Kessler, R., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. (1995). Posttraumatic stress disorder in the national co-morbidity survey. *Archives of General Psychiatry, 52*, 1048-1060.
- Lehman, H. (1985). Somatic and psychological symptoms after the experience of life threatening events: A profile analysis. *Victimology, 10*, 512-538.

- Leitch, L. (2005, November/December). A post-tsunami diary. *Psychotherapy Networker*, 62-69.
- Lerner, M. (2005). In the aftermath of the tsunami: Addressing emergent psychological needs. *The American Academy of Experts in Traumatic Stress*, 1-4. Retrieved March 17, 2005, from <http://www.crisisinfo.org/column1.htm>
- Levine, P. (1996). The body as healer: A revisioning of trauma and anxiety. In M. Sheets-Johnstone (Ed.), *Trauma healing articles* (pp. 1-22). Niwot, CO: Foundation for Human Enrichment.
- Levine, P. (1997). *Waking the tiger*. Berkeley, CA: North Atlantic Press.
- Mayou, R., Bryant, R., & Ehlers, A. (2001). Prediction of psychological outcomes one year after a motor vehicle accident. *American Journal of Psychiatry*, 158, 1231-1238.
- McEwen, B. (1998). Protective and damaging effects of stress mediators. *New England Journal of Medicine*, 338, 171-179.
- Miller-Karas, E., & Everett, G. (2005). *Trauma first aide manual*. Santa Fe, NM: Trauma Resource Institute.
- Musselman, D., & Nemeroff, C. (2000). Depression really does hurt: Stress, depression and cardiovascular disease. *Progressive Brain Research*, 122, 43-59.
- Norris, F. (2001). *50,000 disaster victims speak: An empirical review of the empirical literature. 1981-2000*. White River Junction, VT: National Center for PTSD and the Center for Mental Health Services (SAMHSA).
- Norris, F. (2006). Disaster research methods: Past progress and future directions. *Journal of Traumatic Stress*, 19(2), 173-184.
- Norris, F., Murphy, A., Baker, C., & Perilla, J. (2004). Post-disaster PTSD over four waves of a panel study of Mexico's 1999 flood. *Journal of Traumatic Stress*, 17, 283-292.
- Orr, S., Metzger, L., Miller, M., & Kaloupek, D. (2004). Psychophysiological assessment of PTSD. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 154-160). New York: Guilford Press.
- Raferty, J. (1997). Doing better than the media: Ethical issues in trauma research. *Australasian Journal of Disaster and Trauma Studies*, 2, 1-8.
- Resnick, H. S. (1997). Acute panic reactions among rape victims: Implications for prevention of post-rape psychopathology. *National Center for PTSD Clinical Quarterly*, 2, 41-45.
- Sapolsky, R. M. (1994). *Why zebras don't get ulcers: An updated guide to stress, stress-related diseases and coping*. New York: W. H. Freeman.
- Scaer, R. (2006). *The traumatic spectrum: Hidden wounds and human resiliency*. New York: W. W. Norton & Company.
- Shalev, A. Y., Sahar, T., Freedman, S., Peri, T., Glick, N., Brandes, D., et al. (1998). A prospective study of heart rate response following trauma and the subsequent development of posttraumatic stress disorder. *Archives of General Psychiatry*, 55, 553-559.
- Silove, D., & Bryant, R. (2006). Rapid assessments of mental health needs after disasters. *Journal of the American Medical Association*, 296(5), 576-578.
- Solomon, Z., Laor, N., & McFarlane, A. C. (1996). Acute post-traumatic reactions in soldiers and civilians. In B. A. van der Kolk, A. C. McFarlane, & L. Weisaeth (Eds.), *Traumatic stress: The effects of overwhelming experience on mind, body, and society* (pp. 102-114). New York: Guilford Press.
- Tucker, P., Dickson, W., Pfefferbaum, B., McDonald, N. B., & Allen, G. (1997). Traumatic reactions as predictors of posttraumatic stress six months after the Oklahoma City bombing. *Psychiatric Services*, 48, 1191-1194.
- van Griensven, F., Chakkraband, S., Thienkrua, W., Pengjuntr, W., Cardozo, B., Tantipiwatanaskul, P., et al. (2006). Mental health problems among adults in tsunami-affected areas in Southern Thailand. *Journal of the American Medical Association*, 296(5), 537-548.