

Burnt into memory

Thomas Elbert and Maggie Schauer

As you read this, 35 million humans in various parts of the world are fleeing from war. Their daily lives are severely affected by the psychological consequences of traumatic stress. Today's military actions no longer resemble those of wars long ago, in which one country's army fought the governmental forces of another. In today's wars, more than 80% of casualties are civilians.

A civilian's homeland and life are drastically altered by war. Wartime strategies are ruled by hate and exclusion on both sides, with an attempt to unify one's own group through crimes against humanity. Wars are accompanied by systematic killing and ethnic cleansing — regions are left uninhabitable for local people, landmines remain a constant threat, and cultural heritage and monuments are destroyed. During the Kosovo crisis, one 90-year-old woman brought the crux of modern warfare into focus: "I've lived through the First and Second World Wars but this was worse. This time it was so bad that even the cows ran away. In the night of 24 March, at 3:30 in the morning, as NATO bombs began falling over Yugoslavia, I saw black-masked paramilitia running through Djakovica, shooting, cutting throats and burning houses."

In our attempts to understand the psychophysiological consequences of these atrocities, we have worked with war victims from crisis regions such as the Balkans, the West Nile and Somalia, conducting interviews, observing behaviour and measuring physiological responses to specific stimuli. We are still amazed at the ability of an illiterate survivor, who has been driven out of the bush in southern Sudan and who has had little contact with the outside world, to present us with a classic report of textbook psychiatric symptoms.

Post-traumatic stress disorder (PTSD) is

defined by a specific pattern of core symptoms: re-experiencing intrusions through nightmares and flashbacks — moments of recollection so intense that the victims believe themselves to be back amid the atrocities; an exaggerated startle response and sustained preparedness for an instant alarm response (hyperarousal); difficulty in calming down or falling sleep (describing a readiness for flight or fight, rather than a permanently enhanced autonomic activation); and active avoidance of places where danger was previously experienced, and/or passive avoidance marked by an avoidance of thoughts or feelings related to the traumatizing event. In severe cases, the symptoms may also include dissociation, de-realization, depersonalization or persecutory delusions.

Even though PTSD seems to be present in all corners of the globe, some argue that the disease is a Western concept, and disagree with the empirical testing of this diagnosis for reasons such as a 'medicalization' of politics or neocolonialism. Often, psychosocial-aid organizations believe that scientific investigations intrude on non-Western cultures and should not be carried out there. However, it is clear from scientific observations that PTSD and its symptoms are present across cultures, with the only differences being the culturally specific expression of symptoms and the indigenous ways in which sufferers deal with them. Studies have shown that cross-cultural similarities and consistencies greatly outweigh cultural and ethnic differences. There must be a common underlying basis for these symptoms. We think that psychophysiology, and the structure of memories in particular, provides the answers.

To understand the physiological basis of PTSD and the common thread that underpins it, the concept of memory must be understood in relation to trauma. Autobiographical memory can be divided into 'cold' memories, which include knowledge about periods of our lives and specific events, and 'hot' ones, which comprise emotional and sensory memories. Cold memories (for example, "on 24 March at 3:30 I was living on my farm in Djakovica; we had three cows") are usually connected with hot sensory memories, ("black-masked, dark night, shooting, burning houses") as well as with cognitive ("I can't do anything"), emotional (fear, sadness) and physiological (heart racing, fast breathing, sweating) elements. It is through this string of hot memories that a network of fear is constructed.

Physiological changes that take place in the brains and bodies of survivors of organized violence have been shown to be affected by traumatic stressors and are linked to the

Psychological trauma

A cut into the soul as a result of a horrifying experience can persist as a crippling disease with its core conceptualized as post-traumatic stress disorder.

organization of memory. These changes may include triggering of stress-related systems (such as the hypothalamus–pituitary–adrenal cortex axis), or changes in the functioning and even the structure of the medial temporal lobe and connected limbic networks in the brain.

When an organism is driven down the defence cascade — when flight is impossible, fight futile and only a startling freeze is left in our evolutionary repertoire — the functioning of the medial temporal lobe structures that are the portal for autobiographical memory is altered such that hot and cold memories lose their interconnectivity. We hypothesize that it is this disconnection that causes those who experience flashbacks to become entangled in fear and anxiety. The victim is unable to locate the flashback in time and space because the hot memory is not connected to the cold memory. If this connection could be restored, the horror and 'reality' of the emotions associated with the traumatic memory might be alleviated.

In the long run, the wound that the mind has sustained cannot be entirely healed. But there are approaches that can help. First, reweaving the contents of hot memories back into cold-memory networks can bring relief from the burns of psychological trauma. Second, documenting and acknowledging human-rights violations can dignify the hot traces left in the memory of those who have survived terror and organized violence. ■

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FURTHER READING

- Friedman, M. J. *Post Traumatic Stress Disorder* (Compact Clinicals, Kansas City, 2001).
 - Lang, P. in *Emotions: Essays on Emotion Theory* (eds van Goozen, S. H. M., van de Poll, N. E. & Sergeant, J. A.) 61–93 (Erlbaum, New York, 1994).
 - Kaldor, M. *New and Old Wars: Organized Violence in a Global Era* (Polity, Cambridge, 1999).
 - Metcalfe, J. & Jacobs, W. J. *PTSD Res. Quart.* 7, 1–8 (1996).
 - Neuner, F., Schauer, M., Roth, W. T. & Elbert, T. *Behav. Cogn. Psychother.* 30, 205–209 (2002).
- ◆ www.vivo.org

