

The power of trauma on the body and mind

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Imagine how awful it is for a veteran to go to a store, hear a can drop and end up on the ground in mortal fear for his life. This scenario is not unusual when a trauma memory is retriggered leaving the individual in an extreme state of panic over a perceived rather than real danger.

From a professional practice perspective, I believe that with understanding we can learn how to better serve trauma survivors utilizing a trauma informed care approach. Learning about the power of trauma on the body and mind is a perfect starting point for everyone who strives to help those who have experienced serious life events. With over 85% of people directly exposed to trauma in their lifetime this includes most of us. Clearly, trauma is the great human equalizer.

The “how and why” of posttraumatic stress, subsequent symptoms, and symptom resolution can be understood in relation to the events that occur in the brain during and after a traumatic event. What follows is a *brief* description of the sequence of events during and after a trauma from a body mind perspective. This information is extremely useful when educating survivors and explaining that symptoms are a natural response to extreme events. For more information on trauma response WATCH <http://whatisptsd.com/trauma-what-now/>

Think of a person who has experienced an automobile accident. Sensory stimuli are sent to the midbrain and recorded as a threat to survival. The brain attaches emotions of fear and anxiety to these stimuli and prepares the body for flight or fight. As expected, little cognitive processing occurs at this stage, and the Neocortex becomes flooded with Cortisol and other corticosteroids, essentially inhibiting the ability to consolidate and fully store memories. Future reminders of the memory will reignite the poorly stored memory trace of the event, resulting in survival strategies being engaged, even when there is no actual danger. Even worse, the individual may become upset and agitated when a care provider is attempting to assist because a trauma survivor may perceive this as danger. Survival responses will continue to occur until neocortical processing of the traumatic memory has adequately allowed for re-storage of the memory while concurrently extinguishing the emotional distress associated with the memory.

When a person experiences a traumatic event, the information is registered in the brain along two pathways. The first and quickest path sends sensory information (e.g. scent, related objects, sounds, sights, etc.) to the Amygdala, where a fear response is triggered and the information is cataloged as important for survival. From the Amygdala, the information proceeds to other areas of the brain (i.e. the stria terminalis and the locus ceruleus) responsible for preparing the body for flight or fight and a subsystem of the autonomic nervous system (the

sympathetic nervous system) is activated. The information is eventually stored in the Hippocampus as a memory important for survival. Thereafter, anything that stimulates that sensory memory trace will also potentially stimulate the body to prepare for survival (fear/anxiety/arousal). In other words, when an individual is exposed to related cues to the memory (e.g. scent, related objects, sounds, sights, etc.) these sensory reminders reignite the associated strong feelings. The memory of the traumatic event itself may or may not be recalled. This can leave the individual feeling as if they are in danger but not necessarily knowing why.

This variability in memory can be understood by following the second pathway for information processing. This second and much longer path for the information proceeds through the thalamus, which routes sensory information to appropriate parts of the Neocortex to be analyzed. This information is processed through various areas in the Neocortex where language is used to organize and generate responses (a declarative memory is formed), associations to other information are made, and meaning is created. It is then routed to and stored in the Hippocampus. The Neocortex also contains inhibitory areas that are capable of inhibiting or turning down the survival/fear response generated by the information passed through the Amygdala. In other words, the Neocortex can potentially change the meaning of the original memory trace and alter or modulate the survival response.

Under conditions of extreme stress, the brain produces stress hormones such as Cortisol that interfere with the consolidation of the information from the Neocortex. This also interferes with the possible inhibitory responses that would ameliorate the anxiety of the survival response. Memories that are formed under conditions of trauma often become fragmented. They remain out of context and are thus left unincorporated and unassociated with other memories. The result is that, whenever the memory trace is stimulated, the body reverts to survival mode, which is experienced as anxiety. Because the traumatic memories are often unconsolidated, it is sometimes difficult for a survivor to make the link between earlier traumatic experiences and the current feeling of anxiety. The individual then begins to perform behaviors to relieve the anxiety. If these behaviors work to relieve the anxiety (i.e. remove a noxious condition), they are negatively reinforced to occur again.

These information storage pathways may account for symptoms that occur to a person involved in a motor vehicle accident, for example. During an accident, a large number of sensory cues are recorded, such as the smell of exhaust fumes, heavy traffic, and dim light. This sensory information is recorded in such a manner that, even without actually remembering the original accident, the person in the accident might find themselves becoming extremely anxious at the smell of exhaust fumes or by being in heavy traffic at dusk. Because they do not necessarily begin to consciously recall the original event, they will try to make sense of their feelings using information from the current moment. This is often a confusing task, especially if there is nothing particularly threatening in the current moment. They may

just assume they are having an “anxiety attack” and attribute it to a physiological problem. Or they may simply begin to perform behaviors to reduce their anxiety, such as self-medicating with drugs or alcohol or avoiding driving.

The initial neurological response of the brain is likely the mechanism by which the classical conditioning of the traumatic response is accomplished. In one-trial learning, the sensory stimuli are sent to the midbrain and recorded as a threat to survival. The brain attaches the emotions of fear and anxiety to these stimuli and prepares the body for flight or fight. Very little cognitive processing occurs at this stage because the Neocortex has been flooded with Cortisol and other corticosteroids that interfere with memory consolidation. The fact that memories are unconsolidated and unconnected results in the failure to normally resolve the fear/anxiety/arousal response. In other words, the brain has failed to unhook the sensory information from the fear/anxiety/arousal response. Later behaviors are operationally learned as a way to alleviate this fear/anxiety/arousal.

Subsequent stimulation of this memory trace will potentially reactivate the survival routines until the Neocortex has been allowed to process the information and inhibit the response. Relaxation in the face of exposure facilitates access to neocortical functions (declarative memory, meaning generation, and anxiety inhibition). Recent research suggests that this may be mediated by a decrease in Cortisol under conditions of relaxation. Strictly behavioral interventions pair the memory trace with responses (i.e., relaxation, self-soothing) that are inconsistent with the survival mode (i.e., fear/anxiety/arousal), expanding the response set. Cognitive interventions specifically work to pair the memory trace with more fully processed (and hence more meaningful) information that has the ability to inhibit the survival response.

Thankfully, we now know that the brain is not static, but can be changed by the experience of trauma. It is also clear from the current research on Neuroplasticity that with the right exercises and Massed Practice (or regular corrective exercises or interventions) we can relearn or retrain our brain to overcome traumatic events. We are truly excited by this new research and feel that it reinforces many of the approaches for stabilization and daily practice that we have encouraged our clients to follow for years. It also opens up our minds to the possibility of even greater post-traumatic growth and recovery beyond what we had originally hoped or anticipated, for those we care for.

Huttenlocher (2002) on Neuralplasticity explained that:

An important factor that needs to be stressed is the fact that malleability of the nervous system does not end with maturity. It has been shown to persist to some extent until old age (p. 9).

What an extremely hopeful concept this is. This reinforces the idea that many years after a

traumatic event, we can still apply corrective approaches to reduce suffering among those trauma survivors we assist, because essentially we remain capable of growth and change throughout the lifespan.

The idea brought forward by Doidge (2007) of "neurons that fire together wire together" relates to frequent response sequences, thoughts or behaviors that create powerful connections or pattern habits that lead to more of the same. This is true whether it is a negative fear response or a tendency to see the bright side of things.

Consequently, in order for individuals to function better after trauma, we need to retrain our brains, so that our neurons fire together in a new more adaptive way, and are less inclined to fire around reminders of a stressful past. The later, resulting in chronically high levels of emotional and physiological strain.

In line with Neuroplasticity, I strongly believe that those we serve and care for are not forever damaged by trauma but injured with the very real possibility of recovery. Intentional and deliberate choice followed by consistent action using the right approaches over time (or "Massed Practice" as termed by Taub, 2000) has the power to change the impact of trauma moment by moment. Massed Practice is another concept brought to us through the field of Neuroplasticity and offers up the powerful idea that we have the capacity to "retrain our brains" over time. I believe this perspective is currently re-invigorating the field of after trauma care to include the notion of "healing".

I like the phrase "Practice is not a luxury item" and use it regularly to introduce the importance of Daily Practice to reinforce learning and "retrain our brains". This Massed Practice approach is at the core of the 30 Day Video Stabilization program which utilizes this concept with the client's I work with everyday in my practice. You can find the first 10 days of the 30 Day Video Stabilization Program freely available at <https://findcalm10videos.gr8.com/>

Our goal at the [Traumatology Institute](#) and with [Trauma Practice](#) is to find the strategies to assist those who help trauma survivors and to care for survivors every day.

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