

## Abstract

Recent research and theory on traumatic stress suggest that individuals with unresolved trauma respond with heightened emotions that are difficult to control, often because they have not integrated sensory and emotional responses related to the trauma experience (van der Kolk, 2006). ~~As h~~Health care professionals have observed for years ~~that,~~ these people often respond to triggers with uncontrolled, emotional responses as if they are reliving their traumatic experiences. As therapists continued to work with clients diagnosed with Post Traumatic Stress Disorder (PTSD), they ~~engage~~ these individuals in talking-based therapy to help them gain insight ~~concerning into~~ their traumatic experience. More recent research, however, suggests that talking-based therapy only creates situations in which the clients re-experience their traumatic responses. This research also suggests ~~that~~ these people instead need body-oriented experiences, such as yoga or theater, to help reintegrate the physiological and emotional responses connected to their traumatic experience (van der Kolk, 2008). Although limited research exists, such as Behrens' (2008) project, music therapy methods also may provide experiences similar to those described by van der Kolk (2006) that facilitate the reintegration of an individual's perceptions, sensations, and emotional responses; develop emotional coping skills that ~~assist in learning help to learn~~ to control and modulate emotions and responses; and aid in resolving the trauma.

**Comment [LSB1]:** This is really, really good. I could follow readily throughout the paper. Suggestions below are only that—there's almost nothing here that is incorrect, but we can save you some syllables and make a few places clearer.

**Comment [LSB2]:** Disconnect on tense between "continued" in line above and "engage" here.

~~Unfortunately t~~The incidence of traumatic stress in the world ~~today is~~ staggering – natural disasters, acts of violence, abuse, war trauma, and neglect are widespread ~~across the world.~~ ~~Early t~~References ~~related~~ to trauma date back to the 1860s and for many years ~~only~~ included ~~only~~ male soldiers. Only recently have therapists expanded their view of trauma to include other populations, such as women in the 1970s and children in the 1980s (Caffrey, 2009; Glassman, 2004). Today, ~~we have~~ diagnostic criteria ~~exist~~ in DSM-IV-TR (American Psychiatric Association, 2000) for Post Traumatic Stress Disorder (PTSD) and Acute Stress Disorder (ASD). Complex or Developmental Stress Disorder, ~~a diagnosis~~ for individuals dealing with repeated trauma, has been proposed as a new diagnosis for the future DSM-V (DeAngelis, 2007; van der Kolk, 2005a, 2005b). Three areas of symptoms often are the focuses ~~for~~ treatment: the re-experiencing of trauma related events, increased hypersensitivity and arousal, and avoidance of feelings or related experiences (American Psychiatric Association, 2000).

**Comment [LSB3]:** The sentence as written implies that the situation is worse now than it's ever been, which may be true (or not) but irrelevant. The distraction and extra syllables would be minor were they not in your lead. Removing these words removes the distraction both conceptually and linguistically.

**Comment [LSB4]:** References in what? We have thousands of years of history and literature on these topics. Don't clutter, but give us just a little more here.

**Comment [LSB5]:** Of?

Despite the long history and high incidence of traumatic stress, ~~only~~ recently have researchers begun to explore the neurobiological changes related to the three areas of

**Comment [LSB6]:** You use the word "only" a lot, and usually it's appropriate but not always necessary. You might do a global search and ask if it's needed in each case.

responses and the implications for treatment. Traditional approaches for treating individuals dealing with trauma have involved talking-based therapies. Yet, research and patients report ~~that~~ talking-based therapies are often unsuccessful (Blake, 1993; Meichenbaum, 1994; McNally, 2004; Wylie, 2004). Instead, recent research on neurobiological connections suggests ~~implications for new~~ treatment approaches ~~when working with to~~ individuals dealing with unresolved trauma. ~~Summarizing the outcomes of recent~~ neurobiological research ~~provides support supports~~ the use of music therapy as a treatment ~~approach~~ for clients dealing with unresolved or on-going ~~trauma~~.

[Break]

~~Once a stressful event occurs, Raw~~ information about a stressful event ~~raw information~~ enters through the sensory organs for processing in the right and left hemispheres ~~of the brain~~. ~~While~~ some of this information is integrated, most of the raw sensory information passes through the thalamus which acts as a relay center. From there the sensory information is sent simultaneously to the pre-frontal cortex for evaluation and to the amygdala for ~~interpretation~~. The prefrontal cortex is where ~~novel-new~~ or threatening information is processed ~~so as to~~ identify and modulate fearful responses. The information from the prefrontal cortex also eventually travels to the amygdala, but ~~it arrives~~ after the sensory information ~~that was sent~~ directly ~~sent~~ from the thalamus. In the amygdala, free floating feelings are automatically assigned according to the emotional ~~valence~~ and importance of the sensory information ~~initially-first~~ received from the thalamus. Based on the emotional importance, specific levels of norepinephrine are released that determine the strength of the associated memory trace.

These automatically assigned emotions, communicated as emotional valence and intensity, are then sent to the hypothalamus, the hippocampal system, and the basal forebrain. Signals to the hypothalamus help alert the autonomic nervous system that releases hormones

**Comment [LSB7]:** Suggesting an implication seems redundant.

**Comment [LSB8]:** Or "for."

**Comment [LSB9]:** Unless you really mean that summarizing the research is the critical action.

**Comment [LSB10]:** The single greatest help you could give this presentation is an illustration. I could fairly see, as I read this, a slide illuminating each structure and pathway as you mention it. Certainly you don't want to get bogged down in technology as you present this, but even a static slide and old-fashioned pointer would aid comprehension—particularly for those less familiar with brain anatomy or physiology. That same picture would help readers of the published paper. Even the most dedicated of them is unlikely to go looking in the references for it.

**Comment [LSB11]:** Do you mean while as "although," or "at the same time as?" Worth making the distinction.

**Comment [LSB12]:** That animated slide ought to be a virtual light show through here. 😊

**Comment [LSB13]:** Will everyone in your audience know this term? I don't and couldn't really tease it out of the context. Is it worth a side explanation or an alternative term?

related to the body's fight or flight responses. Signals to the basal forebrain are influential in producing acetylcholine, a neurotransmitter that helps communicate information for learning.

~~The release of a~~ acetylcholine ~~is important in one's processing of stress as it helps~~ people ~~the~~ brain constantly evaluate and learn ~~from different events~~, specifically identifying stressful events and how to respond to them.

Much ~~of the~~ recent interest, ~~however~~, involves the hippocampal system and ~~the~~ connections between the septum and hippocampus. These areas are where the spatial and temporal dimensions of one's declarative memory and the conditioned emotional, sensori-motor, and habits of one's nondeclarative memory are recorded. The new raw, sensory information and emotions from a stressful event are evaluated, categorized, and then integrated with previous sensory information. This integration with the past ~~assists~~ helps people ~~to~~ experience events in the moment while learning about how the present relates to past. For ~~the majority of~~ most non-threatening or non-novel information, the hippocampal system disengages and the information is processed subconsciously. However, information that was tagged as important in the amygdala and then the hippocampus due to a higher release of acetylcholine is sent back to the pre-frontal cortex for additional, conscious processing ~~.....~~

**Comment [LSB14]:** This verges on the obtuse for me, but I'm trusting your audience will know the terminology.

**Comment [LSB15]:** "Assist," as you may recall, is one of my current pet peeves. It almost always requires more syllables than needed to make the point. "Help" often does this job all by its one-syllable self, or with help from one other short word. "Assist" usually needs another preposition \*and\* an "ing" later in the phrase. Try a global search on "assist" and keep it only where truly needed for factual clarity or rhythm in the sentence.

**Comment [LSB16]:** This is such a cool concept!