

## When Cognitive Interventions Fail with Children of Trauma: Memory, Learning and Trauma Intervention

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Changes in society, employment, the media, and family have contributed to traumatic stress and changes in early childhood experiences resulting in altered brain development (Siegel, 2007; Solomon & Siegel, 2004; Schore, 2001). Research documenting the effects of trauma on learning and behavior has become increasingly available and consistent in its descriptions of the cognitive and behavioral alterations following exposure to trauma. There is a strong correlation between trauma and low academic achievement (Perry, 2004; Stein & Kendell, 2004; Schore, 2001) Trauma can alter the way we view ourselves, the world around us, and alter how we process information and the way we behave and respond to our environment (Steele & Raider, 2009). Without intervention these cognitive processes and behavior responses can lead to learning deficiencies, performance problems, and problematic behavior.

Following exposure to a potentially trauma-inducing incident, survivors may become frozen in an activated state of arousal. Arousal refers to a heightened state of alert and fear for one's safety. Short-term and prolonged arousal can affect cognitive and behavioral functions. In the arousal state, changes in the brain are triggered by a variety of stress related functions (van der Kolk, McFarlane & Weisaeth, 1996). Bremner et al. (1996) found that victims of physical/sexual abuse traumatization had lower memory volume in the left-brain (Hippocampal) area than did non-abused. This left-brain function refers to understanding or processing information. One of these functional alterations takes place in the neocortex. Perry & Szalavitz (2007) and others have found that while in the arousal state it becomes difficult to process information because of the altered functioning of the neocortex. In addition, when a child experiences the fear and terror of trauma the experience is recorded without words or narrative. These implicit memories are stored within the amygdala in the limbic area of the brain and cause perceptions of helplessness along with over sensitized fear-alarm reactions whenever the child perceives threat (Colozino, 2006; Oehlberg, 2006). When children are experiencing the world from the limbic area of the brain and not from the neo-cortex they have difficulty learning or problem solving (Forbes & Post, 2006).

If a child/student who has been traumatized remains in an aroused state of fear and finds it difficult to process verbal information, it then becomes difficult to follow directions, to recall what was heard, to make sense out of what is being said (Steele, Raider & Kuban, 2008). Focusing, attending, retaining and recalling verbal information becomes very difficult. Perry (2004) reports that traumatized students often only hear about half of the words spoken by their teachers, causing them to fall behind year after year. These are primary learning functions that can be altered

during or immediately following traumatic exposure and for some continue for long periods of time.

If the arousal response is not discharged or deactivated, the sustained arousal state can lead to sustained cognitive and behavioral dysfunction (Levine & Klein, 2007). These cognitive deficiencies, therefore, dictate the need for non-cognitive approaches to help children overcome or minimize the learning, emotional and behavioral problems they can experience due to failing cognitive processes resources resulting from traumatic arousal. To define an alternative to traditional cognitive approaches, we need to delineate between “explicit” and “implicit” memory processes.

Memory has two functions “implicit” and “explicit”. Explicit memory sometimes referred to as “declarative” memory refers to primary cognitive processes in the neocortex region. In “explicit” memory we have access to language. We have words to describe what it is we are thinking and feeling. Explicit memory allows us to process information, to reason, to make sense of our experiences. Such cognitive processes help us cope.

Unfortunately, unless trained by the military or law enforcement to respond cognitively to threatening situations, the majority of children, even adults are going to respond or experience a trauma in “implicit” memory in the limbic area of the brain. In “implicit” memory there is no language. There simply are no words to describe or communicate what is being experienced. Position Emission Tomography or PET scans have found that trauma also creates changes in the Broca's area of the brain that lead to difficulties in identifying and verbalizing our experiences (Van Dalen, 2001), a process normally accessible via explicit memory processes. In implicit memory our senses contain the memory - what we see, what we hear, sensations of smell, touch and taste become the “implicit” containers of that experience (Rothchild, 2000).

If there is no language in “implicit” memory to help verbalize what that experience is like, how then is it defined and explained? It is defined through an implicit process referred to as “iconic symbolization” (Michaescu and Baettig, 1996). Iconic symbolization is the process of giving our experience a visual identity. Images are created to contain all the elements of that experience - what happened, our emotional reactions to it, the horror and terror of the experience. The trauma experience therefore is more easily communicated through imagery. “When a terrifying incident such as trauma is experienced and does not fit into a contextual memory, a new memory or dissociation is established” (van der Kolk, 1987, p. 289). When memory cannot be linked linguistically in a contextual framework, it remains at a symbolic levels for which there are no words to describe it. To retrieve that memory so it can be encoded, given a language, and then integrated into consciousness, it must be retrieved and externalized in its symbolic perceptual (iconic) form (Steele, 2003).

In order to access this experience we must therefore use "sensory" interventions that allow children the opportunity to actually make us witnesses to their experiences, to present us with their "iconic" representations, to give us the opportunity to see what they are now seeing as they look at themselves and the world around them following their exposure to a traumatic experience. In this sense "a picture is worth a thousand words". Drawings provide a representation of those "iconic" symbols that implicitly define what that experience was like for the child.

When one understands trauma as an "implicit" experience versus an "explicit" (cognitive) experience, it follows that drawing becomes an effective almost necessary avenue to help children release the horrid, terror filled "iconic" memories of their traumatic experiences. Bryers (1996) cited numerous studies that illustrated the use of drawing to help children access those traumatic memories and channel them into a trauma narrative, which could then be reworked explicitly (cognitively) in ways that became manageable for them. Magwaza, Killian, Peterson and Pillay (1993) achieved similar results with South African children exposed to community violence. Following 9/11, The World Trade Center Children's Mural Project was unveiled in March 19, 2002 and depicted over 3,100 portraits drawn by children. This drawing project "served to lessen feelings of isolation and helplessness felt among those children who had difficulty understanding (cognitively) the complexity of this tragedy (Berberian, Bryant and Landsberg, 2003)." These children could not "explicitly" communicate the many ways 9/11 impacted them but they could "implicitly" define it through their self-portraits.

Drawing is by no means a new vehicle for self-expression. Machooen (1949) many years ago noted the fact that the most expressive part of the body and the center of communication is one's face. Saigh (1999) suggested, "children prepare sketches of their stressful experience and verbally repeat (narrate) the content of their experience" (p. 370). Drawing does provide children with a focal point and an impetus to tell their story and to thereafter translate their experience into a narrative (Malchiodi, 1998). Riley (1997) indicated that the act of drawing is a form of externalization, a way for the children to put the experience outside themselves to make it real and concrete. Drawing is a way for that child to allow us to become a witness to what that experience was like by giving us a visual representation of the way they see it (Steele, 2003). Gil (2003) wrote when children draw, they do so on paper of specific physical dimensions with set boundaries. Once the images are placed on the space on the paper the child has in essence contained what might otherwise feel staggering. What might be experienced as disorganized or chaotic may then take on qualities of something that is manageable. Random thoughts and feelings might render children over stimulated and confused. Thoughts and feelings "shrunk down" enough to appear within specified dimensions may give children a sense of control (p. 156).

Drawings help children in the following ways (Steele and Raider, 2009):

- Drawing is a psychomotor activity that helps to trigger the sensory memories of the traumatic experience when it is trauma focused.
- Drawing provides a safe vehicle to communicate what children, even adults, often have few words to describe.
- Drawing engages the child/adult in active involvement in their healing. It takes them from a passive to an active, directed, controlled externalization of that trauma experience.
- Drawing provides a symbolic representation of the trauma experience in a format that makes us a witness to the experience so we can now see what the child sees as he looks at himself and the world around him.
- Drawing provides a visual focus on details that encourage the client via trauma-specific questions, to tell his story, to give it a language so it can be reordered in a way that is manageable.
- Drawing also provides for the diminishing of reactivity (anxiety) to trauma memories through repeated visual re-exposure in a medium that is perceived and felt by the client to be safe.
- Drawing helps the child externalize the experience, remove it to a safe container (chewing paper) outside himself.
- The drawing itself becomes a concrete representation the child can manipulate anyway needed to now feel power over it. The sensory memory of terror-feeling totally unsafe and powerless is replaced with the sensory experience of regaining power over it as well as feeling safe once again as the experience is now contained and outside himself. He can experience putting distance between himself and the experience and thereby feeling safer.

However, to be helpful and safe, drawing activities must be structured and focused on the specific themes (experiences) of trauma such as, terror, hurt, worry, anger, and accountability. The telling of the story must be guarded by trauma specific questions that again help the child stay focused on the “themes” of experience. Once the child can put a story to his experience, the entire experience can then be encoded by “explicit” memory and thereafter reordered in ways the child can now manage, in ways that no longer trigger the fear, terror, worry, hurt, the absence of a sense of safety, the sense of being powerless. Once this is accomplished trauma symptoms begin to diminish and documented by evidence based research (Steele, Raider, Kuban, 2009; Steele, Raider, Delillo-Storey, Jacobs & Kuban, 2008; Malchiodi, 2003).