

Addressing the Unspoken Nature of Trauma:
Utilizing Somatic Processing to Explore Implicit Memory

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Abstract

This paper explores the usefulness of somatic processing to address implicit memory in trauma therapy. Implicit memory, as opposed to explicit memory, is unconscious and cannot be connected to words or understanding. Because of the way traumatic experiences are processed within the brain, traumatic memories can be largely implicit in nature. Instead of verbal expression, these memories can be expressed through bodily sensations, emotions, and conditioned beliefs and actions. Somatic processing attempts to bridge the gap between implicit and explicit memories, which helps connect experiences to words. This form of treatment also allows the person to gain control over their reactions instead of merely reflexively reacting to traumatic reminders. Somatic processing addresses the main goals of therapy including helping to separate the past from the present, developing a trauma narrative, gaining a sense of safety and control, integration, and working toward an optimal arousal level. This paper will also explore various counseling techniques, which can be used in somatic processing.

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Traditional therapies largely rely on verbal expression to work through client struggles (van der Kolk, 2002). However, when working with clients with trauma histories, the use of verbal expression may not always be possible or beneficial for clients to express the events they experience. Trauma not only affects a person's mind, but it can also significantly alter the way the brain processes later information. Thus, it may be necessary to complement traditional talk therapies with interventions which can address the unspoken nature of the trauma or the implicit memory.

Verbally expressive memories that are connected to a sense of understanding as to the memories meaning and place in time are called explicit memories. On the other hand, implicit memories are not tied to a verbal narrative and many times the memory cannot be connected to a certain point in time (Rothschild, 2000). Implicit memories exist in everyday life and are not specific to the topic of trauma. However, for those who experience a traumatic event, implicit memories can mean reacting to unthreatening events as if it is the past trauma, or having uncomfortable bodily sensations and being unable to understand their meaning (Rothschild, 2000; Amir, Leiner & Bomyen, 2010; van der Kolk & McFarlane, 1996).

In order to understand how to address implicit memory persisting from traumatic events, it is necessary to first understand what makes an event traumatic and how that event can affect and alter the way a person views and reacts to the world. This paper will explore how trauma is processed within the brain including how implicit memories are formed. Then it will explore the major goals for trauma therapy and how practitioners can work towards these goals using somatic processing to address implicit memory.

Defining Traumatic Events

Traumatic events by definition in the DSM-IV-TR (2000) involve either experiencing or being threatened with death or injury personally, witnessing death or injury of another human being, or learning about a close family member, friend or acquaintance who experienced “unexpected or violent death” or harm or injury (American Psychiatric Association, pg. 463). Potentially, there are several dimensions that can make an event traumatic; these dimensions add to as well as compliment the DSM definition. Some specific dimensions are the intentionality of the harm, being exposed to a harmful substance, being the cause of the death or harm to another person and being exposed to grotesque scenes or images (Green, as cited in Shalev, 1996).

An important element in what makes an event traumatic is that it creates a feeling of helplessness. The event challenges a person’s views and beliefs of the way the world works (McFarlane & Girolamo, 1996). For example, beliefs are challenged when a person who has generally thought people to be innately good witnesses a person brutally murder another person. This witness now has to reconcile his or her former belief with this new reality. Helplessness may also occur when a person is faced with overwhelming circumstances and does not have the resources to take action to avoid the event (van der Kolk, 2006; van der Kolk, van der Hart & Marmar, 1996a; Goleman, 1995).

Aside from the commonalities of traumatic events, it is important to note that there are unique characteristics of individuals, which could influence the experience of the event. What this means is that two people can experience the same event and one can perceive it as traumatic, while the other may not. Essentially, perception of a traumatic event is subjective and is based on the meaning a person gives to the event (van der Kolk & McFarlane, 1996; van der Kolk et. al., 1996a; Perry, Pollard, Blakley, Baker & Vigilante, 1995). Personal factors, which may

influence perception of an event, are prior stressors, age of the individual and other factors that may exacerbate the effects of the event (Perry et. al.,1995).

It is also important to note the effect of duration. There are one-time, short-term events, which can be defined by the high level of intensity combined with the person not being adequately prepared for the event. There are also repeated occurrence or longer-term events, which are a series of traumatic events over time affecting the individual (McFarlane & Girolamo, 1996; Terr as cited in Rothschild, 2000). The intensity, duration and frequency of the event(s) are all going to influence how stressful the event is to each person, and how well the person will be able to handle the associated stresses.

Acute Stress

Following a traumatic event, the likelihood of having at least some stress reaction symptoms is high. Symptoms of memory intrusion and avoidance are typical following a traumatic event (Creamer, Putnam & Pattison, 1992). These memory intrusions after the event serve to help the individual process the event by learning to accept it as a part of the past and making plans for future events (Horowitz as cited in Van der Kolk & McFarlane, 1996). When the symptoms of acute stress do not fade or lead to processing, the individual may have Post-traumatic Stress Disorder (PTSD). Essentially, PTSD occurs when a person is unable to cope with trauma and healing does not occur (van der Kolk & McFarlane, 1996; McFarlane & Yehuda, 1996). Biologically speaking, a person's arousal level does not return back to the level it was previous to the traumatic event (Rothschild, 2000).

When the Memories Will Not Fade

When people sit down together and reminisce about memories, they are verbally expressing events, which have a place in the past. These memories have the likelihood of fading

with time or at least becoming less clear than the initial moment of experience. People with PTSD do not have such memories about the traumatic event they experienced. The first distinction that arises is that traumatic memories can float free of any ability to recall the memory verbally. These memories can be displayed in flashbacks, bodily sensations, feelings, behaviors and physiological reactions (van der Kolk & McFarlane, 1996; Laub & Auerhahn, 1993; van der Kolk, 2002; Rothschild, 2000). These memories are often vivid and intense (Foa, Molnar & Cashman, 1995) and most often stay the same over time (van der Kolk, 2002). The second distinction is that the memories are not always coherent (Foa et. al., 1995; van der Kolk & McFarlane, 1996) and many times they are fragmented either in time or from understanding. What this means is that the person may remember or experience only part of the memory, and what they remember may not be connected to an understanding of when the feelings, thoughts or images originated from in time (Rothschild, 2000). The last distinction is that the memories are often intrusive and timeless. Small triggers can bring back sensations, emotions and reactions as if the trauma was happening in the present day (van der Kolk & McFarlane, 1996; Applefield as cited in Ogden et. al., 2006). Many times the person is unable to connect these re-experienced memories to a narrative that will explain them (Ogden et. al., 2006; Rothschild, 2000). Not understanding the connection between present feelings and behaviors to past experiences, the person often tries to make sense of the experiences in any way they can (McFarlane & Girolamo, 1996). Many times this leads a person to believe negative messages about one's self including being damaged (McFarlane & Yehuda, 1996), unstable, out of control and unable to deal with everyday life (Ogden et. al., 2006).

One common reaction in people with PTSD is avoidance, including organizing their lives in such a way so as to avoid any triggers of the past (van der Kolk, 1996a). It is not uncommon

for people to begin viewing life events through the lens of their past traumas (van der Kolk & van der Hart cited in van der Kolk, 2002), making small events much more stressful. There is also a tendency to compensate for the feelings and sensations that they are experiencing. This can take the form of making efforts to forget the past through numbing their senses and not allowing themselves to feel (Crawford, 2010). They cut themselves off from their sensations because tapping into them is overwhelming (Yehuda as cited in van der Kolk, 2006). Some issues with this avoidance response are that these compensations use more energy than the normal equilibrium a person lives with, and the behaviors and reactions are maladaptive and persist in every part of the person's life (Perry & Pollard, 1998).

Risk Factors and Protective Factors for Developing PTSD

Every person who experiences a traumatic stressor will not necessarily develop PTSD. There are known risk and protective factors, which influence not only how a person perceives the traumatic event, but also how they cope and recover after the event. It is important to note that simply because someone has a number of risk factors, it is not inevitable that the individual will develop PTSD either. Risk factors only mean that these factors have been shown to be correlated to the development of PTSD.

The family environment and early life experiences can directly affect how a person reacts to stressful events later in life. Perry (1994) found that children's stress response systems can be altered by exposure to unhealthy family environments. Attachment disruptions (Breslau, Grace, Lindy, Gleser & Leonard as cited in Shalev, 1996; Schore as cited in Ogden et. al., 2006), unhealthy parenting, low socioeconomic status (Breslau et. al. as cited in Shalev, 1996), and exposure to childhood trauma (Perry et. al., 1995) all have shown a connection to a disruption in a healthy stress response, affecting how a person responds to and copes with traumatic events

later in life. Additionally, a family history of mental illness was found to be correlated to the development of PTSD (Foy, Resnick, Sippelle & Carroll as cited in Shalev, 1996). Despite the risk factors that can arise from the family and early life experiences, people who have had a stable childhood even if they have been exposed to multiple traumas are more likely to have developed the resources to cope with the stressful events (Terr as cited in Rothschild, 2000).

Social support has been found to impact the development of PTSD. In soldiers with a high amount of combat experience, a lack of social support was found to be connected to development of the disorder (Foy et. al. as cited in Shalev, 1996). On the other hand, if people are able to engage their social supports after the event they are more resilient (McFarlane & Yehuda, 1996; Brandt, 2012). People who are connected to social supports and who either look for help or seek to help others are also shown to be able to handle the stressors more positively (Brandt, 2012).

In a study of soldiers, it was found that people who experience a high amount of combat were more likely to develop PTSD, dependent on their level of trauma exposure and the environment to which they returned post-combat (Foy et. al. as cited in Shalev, 1996). Additionally undergoing the sensory experiences of a trauma increases the risk for adjustment difficulties (van der Kolk, 2002). When traumatic events do arise, those people who feel prepared to deal with the event, can imagine an escape from the event, or feel protected in some way have a greater chance of resiliency (Shalev, 1996; van der Kolk et. al., 1996a).

Lastly, there are many factors specific to an individual, which can influence whether traumatic stress leads to PTSD. “Neuroticism, introversion and prior mental health issues”, as well as less education, were factors correlated with the disorder (Breslau et. al. as cited in Shalev, 1996, pg. 86). Additionally, how a person physiologically responds to the event, such as using a

fight, flight, or freeze response, can have an impact on the susceptibility to PTSD (Shalev, 1996). Then after the event, the way a person reevaluates the event and their responses to the event can be a risk factor (Shalev, 1996). If a person successfully uses a coping behavior during the traumatic event, that person is more likely to reevaluate their actions positively and feel more in control (Shalev et. al. as cited in Shalev, 1996). Additional protective factors that increase resilience related to personality include being “goal-oriented, focused, optimistic, positively challenged by adversity, sense of humor, spiritual, high self-worth, self-acceptance, self-competitive, seeks challenges and physically expressive” (Brandt, 2012, pg. 3).

The Psychobiology of Trauma

Under normal conditions the information that the brain receives from the sensory organs such as the eyes, nose and skin takes a basic route through the brain. Except for olfaction, the sense of smell, which goes straight to the limbic system (Ogden et. al., 2006; Bradshaw, Cook & McDonald, 2011; Amen, 1998), all other senses first get routed into the thalamus, which serves as a gateway to other areas of the brain. The thalamus passes the information to both the amygdala, which produces feelings, and the cortical areas, which produce coherent thoughts. After the amygdala puts emotional charge to the information, the amygdala then passes it on to the brainstem which influences action and movement (van der Kolk, 1996b). During this process, if the information is new or different, the brain will create a molecular change called a memory (Kandel as cited in Perry & Pollard, 1998). When a traumatic event occurs, however, the sensory information can take a different path through the brain. This path is the sole basis for what makes traumatic memory so intense and long-lasting.

Thalamus

The thalamus is the first stop for all information, except olfaction, in any experience. It has been found that there is dysfunction in this area of the brain in people with PTSD (Ogden et. al., 2006; Frewen & Lanius, 2006). Ogden et. al. (2006) suggests that such dysfunction could cause a separation between the higher level brain structures and the lower level ones. Simply put, when there is dysfunction in the thalamus, the various parts of a person's brain may be inhibited from sending messages to one another. This dysfunction could make someone act according to the feelings and sensation generated from the limbic system and brainstem, which would not be congruent with the person's thinking, a product of the higher level cortex (van der Kolk, 2002).

Amygdala

Once the sensory information leaves the thalamus, it is relayed to two structures: the amygdala and the cortex. The first place it reaches is the amygdala (LeDoux as cited in Goleman, 1995). Within the amygdala the information is emotionally processed, charged and takes on a level of significance for the person (Goleman, 1995; van der Kolk, 2002; Rothschild, 2000). The amygdala is also the structure that is on the lookout for threats. If it interprets the information as being threatening, it will send off signals to the rest of the brain; thereby, preparing it to react (Goleman, 1995; van der Kolk, 2002). Biologically what happens is that during intense stress the body releases a stress hormone in the brain called cortisol. The amygdala is part of the system that triggers the release of cortisol, but subsequently it also grows in volume during the same time (Ochberg, 1991). This growth means more blood flows into the amygdala increasing its activation (Hull, 2002; Rauch et. al., 1996). Throughout this experience, the amygdala remembers the incoming sensory information as threatening so that if it ever receives a similar

message again it will respond likewise (LeDoux as cited in van der Kolk, 2002). The more intense the event is, the more intense the memory will be (Goleman, 1995).

It is important to note that while the thalamus relays sensory information to the amygdala and the cortex at the same time, the amygdala receives the information in about half the time because the route to it is shorter (Goleman, 1995). Another element is that what is initially sent to the amygdala may only be a small amount of the total amount of information (Goleman, 1995). Therefore, information reaches the emotional part of the brain before the thinking part, which can start a response even before the person is aware of the significance of the event and the completeness of the information being received (Goleman, 1995; van der Kolk, 1996c). Furthermore, there are some emotional memories that only reside in the amygdala, and as such are outside of narrative memory (Goleman, 1995). In terms of PTSD, this can present as overreacting to harmless situations, as if it were the traumatic event experienced a long time ago, merely based on small amounts of sensory information. A good example of this phenomenon would be a person who ducks after hearing a car backfire, which their amygdala mistook to be a gunshot.

Cortex

The cortex, which receives the sensory information next, is involved in the understanding of the experience on a cognitive level and being able to communicate the experience to others (Singer, 1995; van der Kolk, 1996c). When looking at the brain, it is important to note that not only are there numerous structures, but that these numerous structures can be separated into the right and left hemispheres, which can be impacted differently. Research has shown that during intense stress, there is an increased activation in the right hemisphere and a decreased activation of the left hemisphere (Rauch et. al., 1996). This makes sense in that the amygdala is a structure

located in the right hemisphere. In terms of the cortex, though, which is a vast area composed of numerous structures in both the right and left hemisphere, high stress can mean a decrease in the availability of these various cortical structures to interact with one another (van der Kolk, 1996c). Research indicates that the right cortex seems to house sensory memory and receives processed information from the amygdala, while the left cortex relies on verbal processing and is more connected to the hippocampus, which will be discussed later (Rothschild, 2000). This can be profound when looking at the prefrontal cortex, which appears to play a significant role in traumatic stress reaction.

The prefrontal cortex can be separated into right and left lobes. The right prefrontal lobes seem to play a part in the decision to call up an emotional reaction such as running, attacking or hiding and the left prefrontal lobes appear to be involved in the process of analyzing the situation and saying whether or not there are risks and benefits to the actions, in this way it can inhibit an emotional response if none is needed (Goleman, 1995; Bradshaw et. al., 2011). During a stressful event when arousal is high the amygdala and the right prefrontal lobes receive uninterrupted signals of the sensory information while the left prefrontal lobe is essentially turned off (Goleman, 1995) making it difficult for the person witnessing a traumatic event to create a response that is based on anything but emotion (van der Kolk, 2002).

Another important area of the prefrontal lobes, called the Broca's area, is a region located in the left prefrontal lobe. Broca's area is a key structure in attaching language to feelings and communicating them. Since it is located in the left hemisphere, language expression is inhibited during high arousal states (Rauch et. al., 1996). This deactivation plays a significant role in being unable to connect feelings and sensation to a coherent narrative. For example, people with

PTSD show a decrease in utilization of this area simply by remembering the trauma (Rauch et al., 1996).

Two more areas of the prefrontal cortex play a significant role in the experience of traumatic stress: the medial part of the orbitofrontal cortex and the anterior cingulate cortex (ACC). The medial portion of the orbitofrontal cortex helps to modulate the signals from the amygdala to the other parts of the cortex (Bradshaw et. al., 2011; Goleman, 1995). The ACC plays a significant role in the how people experience emotions as well as incorporating thoughts with feelings (Lanius et. al., 2006). The medial orbitofrontal cortex, as well as the ACC, has shown to be less active in studies of trauma recall (Lanius et. al., 2004).

Hippocampus

The hippocampus is a limbic structure that receives the information directly from the amygdala after it has put emotional charge to the incoming sensory information. The hippocampus' main function is to put the incoming information into the context of both time and place of past sensory memories (Goleman, 1995; van der Kolk, 1996b; van der Kolk, 1996c; Rothschild, 2000; Sapolsky, 1996). Doing so places the new information into a timeline of other memories so that the person can both further evaluate the present situation and refer to this situation in the future (Rothschild, 2000). In times of intense stress, however, when the amygdala is highly activated and is calling for the release of cortisol, hippocampal functioning can be inhibited. The stress hormone cortisol is known to inhibit hippocampal functioning in animals (Rothschild, 2000; Van der Kolk, 1996c). In cases of prolonged exposure to cortisol, the hippocampus of primates experiences cellular death (Sapolsky et. al., 1990). In studies of people with PTSD, there is evidence of small hippocampal size when compared to those without PTSD (Van der Kolk, 1996b; Van der Kolk, 1996c). Without proper hippocampal functioning, sensory

information may not be organized properly into a person's existing memories; thereby, creating memories which are isolated, free-floating and without a history (Van der Kolk, 1996b).

Brainstem

The sensory information having been emotionally charged by the amygdala, but without a context in terms of other memories, then travels down to the brainstem. The brainstem regulates bodily responses in terms of autonomic function, behavioral actions and the release of further neurochemicals such as adrenaline (van der Kolk, 1996b; Perry & Pollard, 1998). The brainstem overall regulates a person's "internal homeostasis" (van der Kolk, 1996c). At this level in the brain, persisting stress can sensitize the system to run at a new baseline (Perry & Pollard, 1998; van der Kolk, 2006). Essentially what this could mean is that persisting stress could alter ongoing autonomic function, such as resting heart rate, the amount of neurochemicals released in the brain (Goleman, 1995) or even instinctive behavioral responses. In subsequent stressful encounters the brainstem may signal the body to react even though the person cognitively knows that there is no threat (van der Kolk, 2002).

Trauma Responses

Once the brainstem alerts the body to take action, a person can react with hyperarousal or hypoarousal. In the event of trauma, this physiological action can come before cognitive or emotional responses (Ogden et. al., 2006). Temperament, development and situational factors have an effect on the response that is chosen (van der Kolk & McFarlane, 1996). Gender can even play a role as it was found that boys are more likely to show hyperarousal, while girls show more hypoarousal (Perry & Pollard, 1998; Perry et. al., 1995).

Hyperarousal can be further broken down into the fight, flight and freeze responses. Each of these responses are mediated by the sympathetic nervous system (SNS) (Ogden et. al.,

2006; Perry et. al, 1995), which when triggered, results in “increased heart rate, blood pressure, respiration, a release of stored sugar, and increase in muscle tone, a sense of hypervigilance and a tuning out of all non-critical information” (Perry et. al., 1995, pg. 277). As the body becomes hyperaroused, the person is unable to fully understand in that moment what they are experiencing (van der Kolk, 1996b). So, the hyperaroused person jumps straight from stimulus to a response (van der Kolk & Ducey cited in van der Kolk, 1996c). These responses are reactive, which can aid in a traumatic event. After the trauma, if hyperarousal persists, these responses are generally not adaptive to the situation (van der Kolk & Ducey as cited in van der Kolk, 1996c; Ogden et. al., 2006). People who experience hyperarousal as a symptom after the event show “hypervigilance, exaggerated startle response and restlessness” (van der Kolk & McFarlane, 1996). As a compensation for these reactions many try to avoid reminders and numb themselves emotionally (Litz & Keane as cited in van der Kolk, 1996c), just the experience of emotions can be construed as dangerous (van der Kolk, 1996c).

Hypoarousal, also known as dissociation, is the other response to trauma. Dissociation tends to be considered the last resort when other responses have been met with failure (Ogden et. al., 2006; Perry et. al., 1995). Dissociation is also found more in the younger population and in females (Perry et. al., 1995; Perry & Pollard, 1998). If the situation involves “physical injury, pain or torture” or when the person becomes “immobile, helpless and powerless” this response is more prevalent (Perry et. al., 1995, pg. 282).

This reaction is mediated by the parasympathetic nervous system, which allows people to shut down and even fake death in order to survive (Ogden et. al., 2006). Essentially it is a disengagement from the outside world (Perry et. al., 1995). People who dissociate often report feeling “shut down”, being disconnected from their bodies and feelings (Ogden et. al., 2006),

“floating” or simply being in a “different place” (Perry et. al., 1995; 281). People can even dissociate entire memories or periods of time from their awareness (Ogden et. al., 2006).

Dissociation serves a logical protective function (Perry et. al., 1995); unfortunately, it is also one of the highest predictors for developing PTSD (Marmar et. al., 1994). Ogden et. al. (2006) suggests that because hypoarousal involves being distanced from emotions and sensation, which can serve as an alert to danger, the person may be at greater risk for re-victimization.

Failure to Recuperate

After the initial trauma, it is normal to have acute stress reactions and it is necessary for a person to take some time to work through these reactions and recuperate. In PTSD, however, the recuperation stage fails to complete leading to a number of difficulties (Ogden et. al., 2006). Part of this failed recuperation is an inability to develop a narrative about the events. One study found that subjects who had experienced a trauma all reported somatosensory memory. Through time these feelings, visions and sensations were able to be translated into a verbal narrative. However, of importance, is that most of the subjects also reported that somatosensory elements still remained after the narrative was complete (van der Kolk, 1996b). This indicates that even though finding a narrative may be a critical part of therapy, it may not be the cure-all solution.

One common occurrence in PTSD is the phenomenon of alexithymia, which is the inability to recognize and name bodily feelings and sensations (Bakal as cited in Ogden et. al., 2006; van der Kolk, 2006; van der Kolk & McFarlane, 1996). This inability causes people to be unaware of their own needs (van der Kolk, 2006) and unable to make rational decisions (van der Kolk & McFarlane, 1996; Damasio as cited in Rothschild, 2000). Conversely it is also common to be hypersensitive to emotions and sensations (Thakkar & McCanne, 2000). Traumatized people easily get overwhelmed by emotions (van der Kolk & Ducey as cited in van der Kolk,

McFarlane & Van der Hart, 1996). This tendency leads many to avoid situations where they will get overwhelmed (van der Kolk, 2002; van der Kolk et. al., 1996b). Van der Kolk (2002) suggests that in these overwhelming situations, there is an inability to self-soothe, which leads some people to return to hyper- or hypo-arousal reactions. Other coping strategies may also be used such as self-harm or food restriction/binging.

Memory Recall

Implicit memory.

The idea of implicit memory has been around since the late 1800's when Pierre Janet talked about "unconscious fixed ideas" (as cited in van der Kolk, 1996b, pg. 285).

Psychobiologically, implicit memory in trauma is made when the hippocampus and cortex deactivate (Rauch et. al., 1996; Rothschild, 2000), allowing only the amygdala and other emotional, visual and somatic areas of the brain to process the information (van der Kolk, 1996b).

What results are memories that are visual, sensory, emotional and somatic in nature without a connection to narrative memory (van der Kolk, 1996b; Rothschild, 2000; Ogden et. al., 2006).

Each of these components can be separated from one another so that a person can have a bodily sensation and not be able to know emotionally, visually or somatically anything else about the memory (van der Kolk & Fisler, 1995). A recent study found that people who have either

experienced a trauma or have PTSD show an increase in implicit memory not only for trauma specific images, but also for negative images not associated with trauma. In fact there was a

negative correlation between explicit and implicit memory for those who had PTSD symptoms

(Amir, Leiner & Bomyea, 2010). Therefore, the greater the ability to speak about the trauma, the lesser present will be the implicit memories.

Conditioned stimuli and implicit memory.

During traumatic events certain visual, auditory, kinesthetic and somatic stimuli get conditioned which later on can elicit implicit memories (Damasio as cited in Rothschild, 2000; Rothschild, 2000; Bradshaw, Cook & McDonald, 2011). One explanation is that during the traumatic event, a large amount of neurotransmitters are released which sensitizes the various stimuli in connection to the memory (Perry et. al., 1995; van der Kolk, Greenberg, Boyd & Krystal as cited in van der Kolk, 1996c). The person considers future experiences in accordance to the stimuli that is present and how similar it is to the past (Perry as cited in Perry & Pollard, 1998). Each time the stimuli elicit the implicit memory the release of neurotransmitters again strengthens the stimuli (van der Kolk et. al. as cited in van der Kolk, 1996b). So each time a person is exposed to a stimulus the implicit memory is called forth (Perry & Pollard, 1998; Ogden et. al., 2006).

Ogden et. al. (2006) also speaks about a tendency for traumatized people to orient and attend to trauma related stimuli at the expense of noticing positive or non-threatening stimuli. In a sense, people “remain on guard of the trauma” (van der Kolk et. al., 1996a, pg. 305). Orientation to trauma stimuli includes increased sensitivity to changes (Levine as cited in Ogden, et. al., 2006) and over identification of trauma based reminders (van der Kolk et. al. 1996a). Discrimination of stimuli to be able to evaluate if it is truly a threat is also a struggle (McFarlane, Weber & Clark, 1993). Inability to discriminate the stimuli appropriately makes it more difficult to respond appropriately to present experience (van der Kolk et. al., 1996a). This phenomenon is shown in part by a study which found that a significant amount of subjects with PTSD were unable to show an appropriate acoustic startle response. The subjects reacted to an auditory

noise as if it were a stressful event, and unlike the subjects without PTSD, were not able to habituate to the noise and calm (Shalev et. al., 1992).

Once the stimuli are conditioned, it may not necessarily remain static. It is possible for these stimuli to get generalized and include a greater number of stimuli that will provoke the same response (van der Kolk & McFarlane, 1996; Perry & Pollard, 1998). Rothschild (2000) states that the fear, which originated from the threat becomes internalized and remains after the event. Similar aspects in other environments can then take on the same fear. Consider the classic experiment by Watson and Rayner (1920) involving Little Albert. Little Albert's fear of the rat was able to generalized to anything white and furry, such as a rabbit.

Arousal level to elicit implicit memory.

People who have suffered a trauma tend to show a higher level of arousal generally than those who have not (van der Kolk et. al., 1996a). In chronically high arousal states, the addition of a new stress can easily overwhelm the system (Rothschild, 2000). Just being in an aroused state can trigger implicit memories to surface (Kardiner as cited in van der Kolk et. al., 1996a). It has been shown that people in high arousal states find it easier to access trauma related memories than any other memory (van der Kolk, 1996c; van der Kolk, 2002). Implicit memories, though, can also increase arousal level (Kardiner as cited in van der Kolk et. al., 1996a), potentially creating a feedback loop. When a person stays in these aroused states for a long period of time, the result is further "fragmentation of perception, action and self-state" (Ogden et. al., 2006, pg. 36).

Conditioned Responses

From the time we are born, events and experiences impact our brain and the neural connections that make up memory, behaviors, emotions and thinking processes (Linford &

Arden, 2009). During highly stressful times there seems to be a stronger connection made within the brain making the coping strategies we use during traumatic events more ingrained in memory. These strategies can even become habitual to where other coping methods are no longer considered an option (Rothschild, 2000).

Conditioned beliefs.

One aspect of trauma that can become conditioned is beliefs. It is common for people to feel guilty or shameful about their response or lack of response to the event (Rothschild, 2000; van der Kolk & McFarlane, 1996). Van der Kolk and McFarlane (1996) state that many victims will even take on responsibility for the event because it gives them a sense of control. However, taking on the blame and the shame may make the person at greater risk for re-victimization. One struggle in overcoming these beliefs about the self is that people who have been traumatized tend to orient towards evidence that verify these beliefs. As the person continues to live in the old beliefs and responses from the trauma they are no longer able to imagine alternative beliefs or responses (Ogden et. al., 2006).

Conditioned arousal level.

Homeostasis is the equilibrium our body naturally rests at including heart rate, breathing, skin temperature, alertness and so on. Homeostasis can be, in a sense, reset to a higher level when exposed to trauma (Perry & Pollard, 1998). This chronic arousal level can lead to ongoing symptoms such as “anxiety, panic, weakness, exhaustion, muscle stiffness, concentration problems and sleep disturbance” (Rothschild, 2000, pg.47). Aside from having an altered baseline arousal level, the hyper- or hypoarousal states triggered by the traumatic event can become habitual states returned to easily by less stressful events or reminders of the trauma (Perry & Pollard, 1998; Kardiner as cited in van der Kolk et. al., 1996a; van der Kolk et. al.,

1996a; Perry et. al., 1995). The more a response is used the more likely the response will be relied upon in later situations (Perry et. al., 1995).

Conditioned behaviors.

In extreme situations it can take as little as one event to permanently habituate a defensive behavior. Likewise, if a behavior is unsuccessful, it can be extinguished even if normally it would serve a protective function (Rothschild, 2000; Perry & Pollard, 1998). Then in subsequent stressful situations the person may revert back to the fight, flight, submission or immobilization responses even if these responses were not adaptive to the current situation (van der Kolk, 2002; Perry et. al., 1995; Ogden et. al., 2006). These reactions can even be triggered by the mere anticipation to a threat (Sumova & Jakoubek as cited in Ogden et. al., 2006). As has been discussed, traumatized individuals tend to orient towards stimuli, which represent danger and so they will be more likely to view and interpret threat leading to these behaviors.

States of high arousal can trigger people to fall back on familiar behaviors (Michell, Osbourne & O'Boyle as cited in van der Kolk, 1996b). These responses can become elicited by stimuli that has been generalized from the original event, but are not directly connected (Rothschild, 2000). On a positive note, behaviors can also be de-conditioned. One study found that when rats that had been conditioned with a fear response were given the option of escape from the traumatic stimulus, the conditioned fear response went away (LeDoux as cited in van der Kolk, 2006). Similarly if defensive responses in humans are shown to be successful they will be used again (Rothschild, 2000).

Effect of Age on the Memory System

Up until now we have focused on how an adult's brain processes and responds to trauma. What is also assumed in the discussion is that the brain that experiences the trauma is fully

developed and functioning in a typical way. Let us consider the brain of a child who is not fully developed and very malleable. Would trauma affect the brain differently? Well, the answer would be 'yes'.

The child's brain is developing. The infant or a young child's brain is mostly functioning in the limbic and lower cortical areas, that are more focused on nonverbal processing (Perry & Szalavitz, 2006). At birth the amygdala is pretty well formed, while the cortex and the hippocampus still are developing (Goleman, 1995). Processing means being able to feel emotions, but not place them in context or in verbal format. As the brain further develops with age, the child will view trauma based on maturity level and the capacity to understand (Pynoos, Steinberg & Goenjian, 1996; Saarni & Harris as cited in Pynoos et. al., 1996). Due to the brain development in young children experiences are more likely to be represented in a single memory which may not be connected to a narrative (Pynoos et. al., 1996).

One significant difference between adults and children when going through a traumatic event is that for children the experience could affect long-term development (Perry et. al., 1995; Pynoos et. al., 1996). As the brain develops, there are critical periods where areas are growing; if trauma interferes with this natural development process it can throw off normal development of other regions later on (Perry et. al., 1995). Perry et. al. (1995) suggests that disrupted development could affect many areas of development, including the development of empathy, mood regulation and ability to attach. While some of these developmental areas could be addressed later, some changes may not be reversible (Perry et. al., 1995).

The trauma may also become the organizing framework for how the child views the world (Perry & Pollard, 1998; Perry et. al., 1995). The child may learn to organize life experiences around the trauma, such as being on the lookout for danger on a daily basis (Pynoos

et. al., 1996). There might also be a decreased ability to handle stress if the child was not taught to self-soothe or was not given adequate care (Porges, Doussarch-Roosevelt, Portalch & Greenspan as cited in van der Kolk, 2006; Ogden et. al., 2006). With a decreased ability to handle stress from such a young age, the child may be at more risk for being traumatized by later stressful events.

Lastly, as noted earlier, how a person responds to trauma can affect long term coping from the event. In young children the dissociative response is much more common since their small size does not make it feasible to fight or run. As a child grows, the child becomes more feasible to fight back or run away (Perry & Pollard, 1998). Because of the dissociative response, the memories of the younger child will more likely be in nonverbal form.

Case for Incorporating Somatic Processing to Address Implicit Memory

Because trauma symptoms can manifest in many ways (Rothschild, 2000; van der Kolk et. al., 1996b), it seems only natural that there would be different means of addressing each of the symptoms. The key is that not one treatment may work for all people. Not every person who experiences a trauma will have ongoing somatic symptoms. In fact studies show that somatic symptoms are more prevalent in those with severe trauma histories (Saxe et. al., 1994; van der Kolk et. al. as cited in van der Kolk, 1996a; Pribor, Yutzy, Dean & Wetzel, 1993). Despite this, implicit memory is still prevalent in trauma. Symptoms such as flashbacks and dissociation come from the limbic areas, which are the seat of implicit memories and not easily accessed by verbal processing (Bradshaw et. al., 2011). Due to a lack of access to words, which interrupts the ability to make sense of symptoms (Williams, 2006), memories and symptoms are more easily accessed through movement and pictures (van der Kolk, 1996a). These implicit memories,

if left untouched, can influence how each person views the self, the world they engage in, and future experiences (Ogden et. al., 2006).

The idea is not to replace traditional talk therapy, but to enhance it with somatic processing so that clients who are unable to relate the events verbally can still be met at another level. The benefit is that for those people who cannot handle verbal memory processing the focus can first be on coping, symptom relief and day-to-day functioning (van der Hart & Steele as cited in Rothschild, 2000). Once stabilization has occurred, work can move on to exploring the emotions and sensations and helping to connect them to a narrative. For those who are haunted by conditioned responses and memories with no understand, it is important to first help them identify and understand these sensations (Rothschild, 2000).

Trauma therapy must work to connect the cortex to the limbic system and brainstem; thereby, aiding in understanding and overcoming implicit fears (Goleman, 1995; Perry & Pollard, 1998). Connection to the cortex is also needed to develop a narrative. Generally there is a decrease in symptoms when the client connects their experiences to a coherent narrative (van der Kolk, 1996a). However, trauma initially is a sensory experience (Kuban & Steele, 2011), which is confirmed by how trauma acutely affects the brain. It has been shown that even after a narrative has been made, there are still physiological symptoms remaining, which the narrative does not remedy (Ogden et. al., 2006; Ochberg, 1991). To address these persisting, and sometimes intense, symptoms there is a benefit in utilizing an approach, which focuses on resolving these symptoms and not necessarily recollecting the memory behind them (Ogden et. al., 2006).

Beyond talk therapy

Goals and Objectives

A “phase oriented treatment” approach has been suggested where during each phase there is an overarching goal for therapy. The first phase is focused on stabilization, which includes education, symptom reduction and feeling identification. The second phase is focused on working with traumatic memories and beliefs. This step deals with de-conditioning responses, exploring defensive actions that were not able to be used, and gaining more beneficial views of oneself and the world. Lastly, the third phase focuses on rehabilitation. This includes integration of all aspects of the self, connecting socially and seeking out positive experiences in life (Ogden et. al., 2006; van der Kolk et. al., 1996b).

Through these phases, there are specific goals that are necessary in trauma treatment. First and foremost, it is important to understand that stress levels may at first increase when a person begins trauma therapy (Rothschild, 2000) so it is important to help clients manage their stress levels (Linford & Arden, 2009; van der Kolk et. al., 1996a). Developing stress management skills will help the client feel less overwhelmed between sessions.

Another goal is to help the client identify and understand the feelings and sensations they have (van der Kolk et. al., 1996a; Rothschild, 2000). Being able to put words to these experiences creates a sense of mastery and control (van der Kolk et. al., 1996b) allowing the person to understand what is happening rather than simply reacting (van der Kolk, 2002). This essentially allows these feelings and sensations to become connected to the cognitive part of the brain (Levine as cited in Williams, 2006), which is a first step toward developing a coherent narrative.

It is important to also focus on reestablishing safety. During a traumatic event a sense of safety has been stripped away. When symptoms persist long after the event, this loss of safety persists through reactions they don't feel in control over. Just helping clients understand their symptoms can promote a new sense of safety by making the symptoms less scary and foreign (Goleman, 1995). This safety is also fostered through the goal of gaining a sense of control over their bodily states and reactions (Kuban & Steele, 2011; van der Kolk et. al., 2006a), which promotes a bodily feeling of safety (van der Kolk & McFarlane, 1996). This can in part be accomplished through seeking out experiences that promote feelings of efficacy and mastery (van der Kolk et. al., 1996a) and “contradict the helplessness and the inevitability of defeat”, which comes with the trauma (van der Kolk, 2002, pg. 388). Since trauma is much of the time an interpersonal event, another important goal, in terms of safety, is to reestablish interpersonal safety (van der Kolk, 1996a). This means reintegrating with support systems and feeling safe to trust again (van der Kolk et. al., 1996a).

It is also necessary to help clients reorient towards pleasure once again. For some pleasure may have come to be associated with vulnerability or for others there may have been both pleasure and pain associated with the trauma so they have come to avoid both. The increase of pleasure in a person's life can act as a balance to the traumatic memories (Ogden et. al., 2006).

Part of the process of treatment will also need to be acceptance. The trauma and the effects it had on their life needs to be accepted and even mourned to help the person move on (van der Kolk et. al., 1996a; Janet as cited in Ogden et. al., 2006).

Another goal is for the client to be able to separate the past from the present. What this means is being able to differentiate the past from the present and then stay present in the here and now without re-experiencing the trauma (Rothschild, 2000; Janet as cited in Ogden et. al., 2006).

Part of this goal is being able to understand how current stress and relationship patterns are connected to the past (van der Kolk, 1996a). In doing so the person is then able to respond more appropriately to present circumstance (Ogden et. al., 2006).

Once trauma victims can separate the past from the present they also need to learn how to reorient attention away from the past and away from stimuli that remind them of the past (van der Kolk, 2006; Ogden et. al., 2006). If they continue to be oriented to trauma stimuli then they are more likely to re-experience the trauma (van der Kolk et. al., 1996b). Once they learn to reorient they can also learn to develop some control over their responses (van der Kolk, 2006).

A major goal of therapy is to be able to find a narrative and tell the story of what happened (Goleman, 1995; Williams, 2006; van der Kolk, 2002). Psychobiologically, this means connecting the memories to the cortex where they can finally be verbally processed and understood (Goleman, 1995). Being able to verbalize the experience gives a person a more realistic understanding of what happened (Goleman, 1995). It also helps the person find empowerment and control over the memories (Harber & Pennebaker as cited in van der Kolk, 1996a), find meaning in what happened (van der Kolk & McFarlane, 1996), and decrease their helplessness by being able to communicate with others (van der Kolk, 2002). Speaking about the trauma can be a daunting task, so Rothschild (2000) suggests addressing what happened after the trauma first so that when they do talk about the actual event it can be done in the memory of living through it. It is important to note that people will differ in their needs to verbalize. Some may find talking about it sufficient enough, while others may need to express it somatically as well (Bradshaw et. al., 2011).

Integration is yet another goal of therapy. This goal focuses on processing (Shalev as cited in Ogden et. al., 2006) and bringing back together the various aspects of self such as

thoughts, feelings and body movement/sensations into an integrated whole (van der Kolk, 2006; van der Hart & Op den Velde as cited in van der Kolk et. al., 1996a). This can be a challenging process as it means “integration of the alien, the unacceptable, the terrifying and the incomprehensible into their self-concepts” (van der Kolk et. al., 1996b, pg. 419). It may take some exploration to find which parts of the experience are not integrated, but once found they can be brought back together (Rothschild, 2000). Ogden (2006) suggests aiding this process by limiting the information being integrated at one time. Examples of integration would be finding and completing defensive actions, which were cut short (Ogden et. al., 2006) and integrating memory pieces into a complete narrative (Crawford, 2010). Once successful integration happens, Ogden suggests that the client will find trauma stimuli more manageable and they will be more able to control their reactions (Ogden et. al., 2006).

As we have explored, both the hyperarousal and hypoarousal states result in an inability to fully process or adequately react to the present environment. For this reason, it is necessary to seek out an optimum level of arousal somewhere in the middle of the two extremes (Wilbarger & Wilbarger as cited in Ogden et. al., 2006). It is necessary to aid the client in learning to reduce and control their arousal level (Kuban & Steele, 2011; Ogden et. al., 2006). Memories need to be able to be processed safely (Kuban & Steel, 2011). This may mean that working on producing a coherent narrative will need to be put on hold (Ogden et. al., 2006) because there is little benefit to having the person re-experience the horrific feelings associated with the trauma if they do not have the resources to deal with them (Ogden et. al., 2006; van der Hart & Steele as cited in Rothschild, 2000; van der Kolk, 2002). To aid clients in remaining in this optimal arousal zone, it may be necessary to take breaks and go slow (Rothschild, 2000; Kluft, 1996). To this end, catharsis is not initially encouraged (Ogden et. al., 2006). Another viewpoint is

suggested by Schore as he notes that infants develop higher levels of arousal tolerance by becoming aroused and then learning to bring the arousal back down (as cited in Rothschild, 2000). Similarly, if a client moves toward one of the extreme arousal zones, they can be helped to come back to optimal arousal and potentially gain better tolerance for arousal.

Role of the Therapist

In trauma therapy counselors need to be aware of their role and what they can do to benefit the client. One important consideration when working with trauma is how to appropriately work with trauma memories. Ogden (2006) states that the counselor's role is not to confirm whether the memories are true, but to be an empathic presence validating the client's experience. She further warns to "avoid leading questions" and to not make full recollection a goal (Ogden et. al., 2006, pg. 240). Other important considerations for the counselor are to develop a trusting therapeutic relationship, attend to the here-and-now, be cognizant of the pace of therapy and help the client prepare for the future.

Therapeutic relationship.

The therapeutic relationship is a very important tool in trauma therapy. Especially if the trauma was interpersonal, issues of trust and safety need to be addressed early on and in itself could be a large part of therapy (Rothschild, 2000). Trust and safety are going to be the foundations before which trauma therapy can truly begin (Ochberg, 1991; Rothschild, 2000; van der Kolk & McFarlane, 1996). Establishing trust is pivotal because the client will be discussing and potentially re-experiencing elements of the traumatic event and this needs to happen in a safe and trusting environment where they can escape the helplessness they once felt (Kuban & Steele, 2011). It is also through this safe relationship where they can explore healthy boundaries once again (van der Kolk, 1996a; van der Kolk, 2006).

One reason trust is necessary is due to transference. Many times past relationships will be reenacted in the therapeutic relationship and the counselor's job is to notice and bring these dynamics to light (van der Kolk, 1996a; Ogden et. al., 2006). The counselor should help the client separate the past from the present (Rothschild, 2000; Ogden et. al., 2006) and understand these tendencies (Ogden et. al., 2006). One benefit of this work is to help the client differentiate the two experiences, and then experience a more positive attachment with the counselor (Schoore as cited in Rothschild, 2000).

Lastly, another major benefit of the therapeutic relationship is found in the role of mirror neurons in the brain. The benefit of mirror neurons is that through observation, a person can learn to implement new behavioral patterns simply by watching another person (Rizzolatti, 2005). These neurons actually map the same area of the brain as if the person were doing the action themselves (Stern as cited in Ogden et. al., 2006). So the counselor can help the client by demonstrating complete defensive actions or missing resources (Ogden et. al., 2006).

Attend to the here and now.

One of the goals for therapy is to be able to stay in the present and one way the counselor works towards this goal is by attending to the here and now. The counselor does this by looking past the narrative and observing nonverbal language (Bradshaw et. al., 2011; Ogden et. al., 2006). The therapist then reflects these observations back to the client and works together to process them (Bradshaw et. al., 2011; Ogden et. al., 2006). The goal is to make clients mindful of their experiences (Ogden et. al., 2006), and help them to be able to identify these experiences on their own (Gallese, Eagle & Migone as cited in Bradshaw et. al., 2011). To note, the counselor is not only focused on trauma related reactions, but also areas of competence and strength (Levine as cited in Ogden et. al., 2006).

Pacing and reorientation.

Part of the therapist's role will be to pace the trauma related work. It may be necessary to set a slow pace, limiting the amount of information being processed, so that the information can be digested more easily while the person remains within an optimal arousal level (Goleman, 1995; Carroll as cited in Ryan, 2010; Ogden et. al., 2006). The counselor will need to be directive at times (Rothschild, 2000), and may even need to interrupt the client to assure the client does not get overly aroused (Ogden et. al., 2006; Rothschild, 2000). The counselor should interrupt the client and direct that person to observe their bodily states (Ogden et. al., 2006). By doing so the client is taken out of the experience (limbic) and into the cognitive observer role (cortex). The counselor also needs to be sure to facilitate a balance between working directly with memories and taking breaks. Working directly with the trauma allows the person to learn a new emotional response to the memories (Goleman, 1995). However, breaking allows the arousal level to lower (Rothschild, 2000), which aids in making the exploration safe for the client (Ryan, 2010).

Preparing the client for the future.

Lastly, the counselor needs to help the client prepare for the future. Since the therapeutic relationship is important, part of this will include processing and preparing the client for potentially perceived betrayal by the counselor (Rothschild, 2000). For example, a person may feel betrayed if the counselor needs to cancel an appointment, so this event should be processed and prepared for prior to the event. Lastly, the counselor will need to help the client consider and plan for challenges they may face in the future (Ogden et. al., 2006), such as discussing responses to a breakup or death. This counselor role connects to developing resiliency in that people are more resilient if they feel prepared.

Somatic Processing

Any techniques or therapies used should be connected to specific, clear goals and must be mutually agreed upon. It is also suggested that an attitude of exploration and experimentation be encouraged, which promotes the person to try new behaviors to find what works best for individual clients without fostering expectations as to outcomes (Ogden et. al., 2006).

The basics.

Diet, sleep and exercise will be critical factors in treatment as they are necessary for proper brain function and likely to be connected to present struggles (Linford & Arden, 2009; van der Kolk et. al., 1996a). Likewise, van der Kolk et. al. (1996a) suggests that regular schedules and routines are necessary for those who have a tendency to dissociate since dissociation interrupts a person's sense of time.

Grounding and relaxation.

Before any trauma work begins, Rothschild states that a person needs to be taught how to slow down (Rothschild as cited in Rothschild, 2000) so as to stay in an optimal arousal zone. Both grounding and relaxation can serve this purpose. Grounding is a technique used to bring a person back into the here and now, which is important especially with dissociative clients as dissociating takes them away from place and time. Grounding can be done by having the client reorient to objects in the room, becoming more aware of their physical connection to the ground, such as how heavy their legs and feet feel, or by asking the person to actually walk about the room (Ogden et. al., 2006). This process can also be facilitated through balance boards and acupressure (Bradshaw et. al., 2011).

Relaxation is necessary for hyperarousal as the body gets over stimulated and tense (Crawford, 2010). Rothschild (2000) suggests the use of both an anchor and a safe place. An

anchor is a specific thing, perhaps a person, animal or item, which is connected to a feeling of relaxation. A safe place is a type of anchor, but specific to an actual place the person has been where the person felt protected (Jorgensen as cited in Rothschild, 2000). During times of high arousal, conversation can be directed toward the anchor or safe place to aid in relaxation. Additionally, it is suggested that light toning exercises such as push ups and leg lifts may help calm the body into relaxation ((Rothschild, 2000).

Practicing reorientation.

Before a person learns how to reorient, they must first discover their triggers. To do this a client should be helped to identify when they were last calm and when they first felt an increase in arousal, then the client explores everything that happened in between. Most likely a feeling or emotion will arise to indicate when they have found the trigger (Rothschild, 2000). Finding the trigger is one part of taking control. The next part involves the purposeful switching of attention from the trigger or a bodily state unto a more positive thing (Ogden et. al., 2006). Reorientation can even be done by purposefully having the client orient towards triggers, which makes the action a choice rather than an involuntary one (Ford as cited in Ogden et. al., 2006). The client can then be asked to switch between positive and negative stimuli to practice reorientation (Ogden et. al., 2006). Another method is to have the client state both the feeling being experienced, and the things they are presently aware of at the same time, such as ‘I feel unsafe, but there is nothing threatening around me right now’ (Rothschild, 2000).

Techniques

Body Awareness Interventions

Some basic body awareness techniques are to focus clients on only bodily sensations and movement (Ogden & Minton, 2000) and to assist them in exploration by reflecting on

observations (Ogden et. al., 2006). When the client does notice a bodily sensation the counselor can ask him if he has ever felt like that before. If the client is unable to connect the present with past experience, then he can be asked what another person might feel if that person had a similar sensation (Rothschild, 2000). The client can also be asked to stay with a certain movement or sensation until it fully develops and is experienced as a whole (Ogden et. al., 2006). Throughout this time the counselor can facilitate body awareness through direct, present-tense questions (Rothschild, 2000). The client might be asked non-trauma related questions (Rothschild, 2000) such as how does the texture of the chair feel on their hand or if the client is hungry. Or the questions can be trauma focused; (Ogden et. al., 2006) such as, ‘when you talk about the incident what do you feel in your body?’ Such questions foster body awareness as well as staying in the present moment.

Body awareness is an important step to being able to interpret implicit memories stored at a somatic level (Rothschild, 2000). In fact, body states, such as posture, can either precede or be produced by a conditioned belief or feeling. Developing more awareness can help the person to acknowledge these beliefs and feelings and even develop more positive body states (i.e., sitting straight rather than hunched), which will counter these beliefs (Ogden et. al., 2006). Body awareness also fosters staying in the here and now (Rothschild, 2000) and differentiating body sensations from other emotions or thoughts they may have (Ogden et. al., 2006). For example, a fast heartbeat could come from experiencing a threat or from aerobic exercise, but if a fast heartbeat always comes to mean a threat than not even exercise is safe. A final benefit to body awareness is that it is a start to restoring normal functioning back to the body, including the ability to experience positive sensations (Rothschild, 2000).

It should be noted that body awareness may not always be beneficial to the client. Counselors should take caution to use body awareness when connection to the body leads directly to extreme arousal. Focusing on body awareness may also cause some to focus too much on becoming perfectly aware, which may bring an increase in anxiety (Rothschild, 2006).

Breathing exercises.

Focusing on breathing patterns can be one mode of body awareness. Some clients will have a tendency to breath too fast or too slow. Clients can be encouraged to explore sensations of different breathing patterns. Client observations have indicated the general increase of arousal on inhale and decrease on exhale (Ogden et. al., 2006).

Mindfulness.

Mindfulness is the act of purposefully orienting and observing the here and now experience of the inner world (van der Kolk, 2006; Ogden et. al., 2006). The counselor helps develop mindfulness by slowing the pace of therapy and directing the client to notice the here and now experiences (Ogden et. al., 2006). This could even mean mindfully attending to and allowing a feeling to develop and subside on its own (Linford & Arden, 2009). Being mindful is considered an act of the prefrontal cortex, which needs to be stimulated in trauma therapy (van der Kolk as cited in Ogden et. al., 2006). The benefits of mindfulness are an increased connection to the cortex, an opportunity to expand arousal tolerance (Ogden et. al., 2006), and a switch to controlling one's being rather than reflexively reacting to inner states (van der Kolk, 2002).

Physical boundaries.

Working on physical boundaries can foster a sense of safety and help restore more healthy physical boundaries in relationships (Ogden et. al., 2006). It can also create a sense of

control and help people feel able to protect themselves (van der Kolk, 2006). According to Ogden people can become underboundaried or overboundaried (Ogden 286). One way to address boundaries is to experiment in session with how the client feels when she is closer to or further from the counselor. Another way is to let the client place a string of yarn around her in a metaphorical bubble (Ogden et. al., 2006; Rothschild, 2000). Although clients are unable to control other people these exercises aid in self-awareness to know their comfort level so they can experience positive feelings from relationships (Ogden et. al., 2006).

Artistic Interventions

Artistic expression comes from the right side of the brain and so is an intervention that can access implicit memory stored away from consciousness (Goleman, 1995). In one situation a young girl was asked to draw about her rape, which she had previously stated she had let happen to her. However, as soon as she drew the picture, she exclaimed that it was not her fault at all. Drawing had allowed her to view the trauma differently (Kuban & Steele, 2011).

Body mapping and tracing books.

Body mapping and the use of tracing books are two initially nonverbal ways of bodily expression. Both are focused on an outline of the person's body, which for tracing books should be on notebook sized paper and for the body maps could be done on any other medium. Both have the client artistically draw out their bodily experiences on the outline. They can even write statements or questions all around the page. In terms of the body map the client may also be asked specific questions such as how their body is impacted by dissociation, hyperarousal or medication. The tracing book is mostly used outside of treatment as a daily record of experiences while the body map can be used in session. Once the maps are complete they can be narrated to the counselor thereby connecting body states with a narrative. Both the body map

and the tracing book should be seen as a means to enhance communication and reflection and not a lasting representation of the trauma (Crawford, 2010).

Drama.

Drama provides a unique experience for people of all ages to process trauma. Through drama the person narrates what happened (van der Kolk, 2002), but has full control over the dramatic act (Fisher, Murray & Bundy as cited in Ogden et. al., 2006). Therefore, the person can act out a better, more positive resolution to the event (van der Kolk, 2002; Goleman, 1995). Drama also has the benefit of being able to incorporate humor and play into a therapy that can often be very stressful (Ogden et. al., 2006).

Body Movement Interventions

The goal of body movement interventions is to learn to move in a way that represents who one is and what one wants. People are given a sense of control when they learn to correct habituated responses and movements (Ogden et. al., 2006). Through these interventions a person is also brought into the here and now such as asking a client to move a body part or walk around to distinguish present reality from re-experiencing the past (Rothschild, 2000).

Finding incomplete bodily movements.

At the time of the trauma, defensive actions may have been cut short and so were unsuccessful. These actions may remain in their truncated form long after the trauma has ended. In treatment the counselor can ask the client to explore a movement and follow it to completion. Other times the counselor can direct the client to executing an action that they feel would have made them feel more safe in the event (Ogden et. al., 2006).

Yoga.

Yoga may be one way to help client's lower arousal and learn to focus on their bodies. In one study heart rate variability was significantly changed for those who studied yoga over eight sessions as opposed to those who did not. Another study showed significant improvement in hyperarousal for the yoga group as compared to a group undergoing dialectical behavioral therapy (van der Kolk, 2006).

Self-defense training.

Through self-defense training people can learn ways to protect themselves and survive in threatening situations (McFarlane & Yehuda, 1996; Rothschild, 2000). Additionally this training can restore natural defensive actions, which were lost during the trauma (Rothschild, 2000). If the client feels prepared for a threat it will foster resilience for future events and lessen present feelings of helplessness (McFarlane & Yehuda, 1996).

Eye Movement Intervention

Eye Movement Desensitization and Reprocessing (EMDR) is a treatment in which bilateral stimulation through eye movement and auditory sound help to process the traumatic event. The client thinks about the traumatic event while doing a set number of eye movements and occasionally is asked what the client is aware of, whatever the client states as a new awareness becomes the next focus (Shapiro, as cited in EMDR Institute, n.d.). It should be noted that although included within the list of somatic processing, EMDR is a specialized treatment and any practitioners wishing to use this tool with clients need to become certified and undergo supervised practice before using it with clients unsupervised.

One of the purposes of EMDR is to lessen the emotional charge of trauma memories (van der Kolk as cited in van der Kolk, 2002). One study further found that EMDR aided in

processing and being able to distinguish real from imagined threat (Levine, Lazrove & van der Kolk, 1999). In a study comparing EMDR to medication and a placebo, EMDR initially had very similar results as the medication. After six months only, the clients receiving EMDR continued to improve, and over half of the EMDR group no longer had PTSD symptoms (van der Kolk et. al., 2007). Several studies, however, have indicated that there is little difference between the results of EMDR and other non-eye movement exposure therapies (Devilley, 2002; Rothbaum, Astin & Marsteller, 2005). This finding questions the necessity of eye movement interventions during treatment, especially when other treatments have been found to be effective with clients with PTSD. Despite this finding, EMDR has been shown to be effective with a number of populations (e.g. Levin et. al., 1999; Wilson, Silver, Covi & Foster, 1996; Wilson, Becker & Tinker, 1995), so further research with PTSD is warranted.

Conclusion

Somatic processing, when integrated with traditional therapy, can aid those whose memories are stored away from conscious understanding. Since the initial trauma is largely a sensory and bodily experience, somatic processing can help a person learn to control one's arousal level and conditioned responses. It can help restore a sense of bodily safety and control, which leads to feelings of empowerment. Through body work, a person can be taught how to stay in the present and reorient toward non-trauma related stimuli. Somatic processing also compliments traditional therapy as it aids the person in connecting implicit memories to the cortex where they can be turned into explicit memory thus being able to verbally explore their experience. The ability to verbally express an experience helps people increase their ability to communicate effectively with others, which will in turn allow them to seek out social supports.

Somatic processing not only addresses the key goals of trauma therapy, but also increases factors of resiliency, aiding the person in managing future life stress.

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