Art Therapy and Neuroplasticity: How Creativity Can Heal Trauma

A Literature Review

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Abstract
The literature review focuses on the neurobiological theories of the impact of trauma on the brain, the resulting impairments in functioning, and the healing potential of creativity engagement through art therapy. The literature review strives to answer the research question: can art therapy assist in recovery from posttraumatic stress disorder (PTSD)?
This researcher determines to discover the neurobiological mechanisms in the brain that result from a traumatic experience and subsequent art therapy interventions to treat individuals with PTSD effectively. This researcher speculates that effective art therapy interventions can lead to the integration and transformation of an individual’s experience from a trauma event and may improve the functioning level of individuals who have had debilitating traumatic experiences. This researcher speculates that creativity engagement in a therapeutic environment can promote neuroplasticity resulting in long-term changes of negative patterns of thought, and resolution of destructive perception of self as a result of trauma. This researcher speculates that art therapy can open an avenue for individuals with PTSD to reframe traumatic events, leading to higher levels of resiliency. This paper describes art therapy as a unique approach, which is most appropriate for the multidimensional treatment of PTSD.
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Art Therapy and Neuroplasticity: How Creativity Can Heal Trauma

The purpose of this paper is to explore effective art therapy interventions with individuals with posttraumatic stress disorder (PTSD.) Literature is collected and analyzed to reveal how art therapy may lead to recovery from traumatic experiences. The unique contribution of art therapy in the treatment of PTSD is explored in three major areas: (1) the expression of traumatic memories, emotions and fears related to trauma, (2) the process of symbolization and meaning making of traumatic experiences, and (3) the establishment of new thought patterns related to resiliency and strength through the reframing and integration of the traumatic experiences into healthy self-perception. This literature review will also explore how art therapy may lead to higher levels of recovery and functioning than with traditional “talk” psychotherapy.

Research on this topic can also lead to answers about the effectiveness of therapies that support mind-body-spirit connections. To grow the field of art therapy, the science behind how the mind, body and spirit heal when stimulated through a creative task must be explored. New research in these areas will only help solidify what many art therapists have witnessed: that engaging in creativity in a therapeutic environment restores health and wellbeing. Research into this topic has implications for our increased understanding of how to not only recover from mental health disorders but also how to achieve optimal health and wellness. Now with advances in new fields such as neuroscience and psychoneuroimmunology, scientists have been able to delve deeper into the mysteries of the brain and measure what happens during creativity engagement.

Scientists now have new ways of mapping different regions of the brain through imaging technology such as, Magnetic Resonance Imaging (MRI), Functional Magnetic Resonance Imaging (fMRI), Computed Tomography (CT Scan) and Positron Emission
Tomography (PET), that are providing means to gain comprehensive understanding of the phenomenon of how brain functions shape experience and vice versa (Hass-Cohen & Carr, 2008; Kapitan, 2010; Malchiodi, 2003; McNamee, 2006; Riley, 2004). Ever more interest in the link between the mind, body and spirit is resulting in seminal and large-scale qualitative and quantitative research. Discoveries about the brain’s ability to adapt and change is rapidly informing and growing the fields of neuroscience, interpersonal neurobiology, psychology, medicine and holistic therapies. Furthermore, research into the complex system of neural networks and their vast ability to change is adding to our understanding of the possibility of recovery from psychiatric disorders, such as PTSD.

The impact of advancements in these fields has broadened the depth of understanding of how neuroplasticity is possible, even into the late years of life. These advancements have subsequently led to theoretical models regarding the interconnectivity of the mind, body and spirit. These models can give new insight into the complexities involved with perceptions about ourselves, perceptions about the world around us, and perceptions about our interactions in relationships with other people.

Through studies encompassing neurobiology, neuroplasticity, and differing functions of the right-brain and left-brain hemispheres, as well as the uncovering of the mirror neuron system, it is now possible to provide scientific evidence for the claim that art therapy is effective in treating a variety of disorders and symptoms. However, more research needs to be continued in this area particularly given the increase in demand for alternative therapies such as art therapy.
How Creativity Can Heal Trauma

Art Therapy

Art therapy has existed as a profession since the 1940s, however until recently, little research has been developed to demonstrate how this expressive arts modality actually works. Art therapy involves the combination of the creation and activity of art making, resulting products, and a therapeutic relationship between client and therapist. Art therapy is a powerful tool that involves the creative process through art making to help people experience stressful events in a healthy way, find relief from emotional or physical illness symptoms, gain self-understanding and insight, and heal from trauma (Malchiodi, 2003).

In art therapy, the artwork created is an object that represents the connections of the mind, body and spirit of the artist. These mind-body-spirit connections can lead to feelings of mastery and control. Art therapy encourages self-expression and externalization of feelings, and facilitates the integration of the right and left hemispheres of the brain that lead to a greater balance of mental states and experiences and leads to a reduction of the effects of stress (McMamee, 2004). According to the American Art Therapy Association, an increasing number of medical centers are beginning to include complementary healing programs along with traditional therapies which is leading to a greater understanding of how creativity engagement such as in art therapy can lead to enhanced healing, and overall health, and wellness.

Mind-Body-Spirit Connection

Through the developing area of Psychoneuroimmunology, or PNI, there are new discoveries in the neurobiology of cellular structure that explore the physiological link between the mind, body and spirit and how these new insights on the interconnectedness
of the mind, body and spirit are leading to increased knowledge of how to treat a variety of disorders and illnesses (Zammit, 2001). The study of Psychoneuroimmunology is also illuminating how the science behind mind-body-spirit medicine is providing evidence of the efficacy of art therapy as a treatment modality, as it approaches treatment of an individual, in a holistic way. Pert (1997) believes that the brain is connected to every aspect of the body. She concludes, that the term “mobile brain” is an appropriate explanation of the intricate network that flows through the entire body system relaying endless amounts of information back and forth between body systems. Pert’s (1997) research on neuropeptids suggest the important role psychology plays in understanding what actually happens with what is referred to as the mind-body network. She theorizes,

The mind, then, is that which holds the network together, often acting below our consciousness, linking and coordinating the major systems and their organs and cells in an intelligently orchestrated symphony of life. Thus, we might refer to the whole system as psychosomatic information network, linking psyche, which comprises all that is ostensibly nonmaterial nature, such as mind, emotion, and soul, to soma, which is the material world of molecules, cells and organs. Mind and body, psyche and soma. (p. 185)

This mind-body-spirit theory supports the notion that artistic expression can lead to increased healing and processing of experiences by tapping into deep unconscious emotions and then providing an avenue for expression of those emotions. In this way, art therapy brings to light how visual images are a reflection of emotional experiences and how those emotional experiences affect thoughts, behaviors and beliefs. Furth (1988) as referenced by Zammit (2001), believes that healing occurs at the level of the unconscious and describes art therapy as an effective method of moving what is going on in the
unconscious “network” of the mind into conscious awareness. Artwork symbolically expresses our unconscious thoughts and experiences. Through art making in a therapeutic environment, clients can learn how to access and cope with unconscious thinking patterns which can lead to unhealthy behaviors, and which may ultimately cause illness or disease. Malchiodi (2003) further explains that the act of creating imagery is key to facilitating change because the individual is called to go through a reframing process while making the image. This reframing process promotes the client to test out, or investigate a new way of perceiving experiences through examining the content of their artwork. Malchiodi (2003) postulates that this reframing process allows for profound healing at a deep level because the client is highly involved in his or her own healing process.

Therapeutic Environment

In art therapy the therapeutic environment is also an important aspect of aiding in the healing of an individual. During an art therapy session, an individual creates art images in a supportive environment, and the artwork created can help with gaining insights into difficulties and problems. Processing the artwork created with the therapist also becomes a catalyst that may lead to positive change in the individual’s sense of self. Empathetic and validating interactions with an art therapist are integral aspects of the process of therapy (Kapitan, 2010). Creating art is also an exciting and pleasurable activity and can help an individual distance himself or herself from the tangible object or image created in the therapeutic process that may represent the difficulty or problem.

Art making is a physical experience, which can create a relaxation response. Art making is also a social experience, which can lead the creator to redefine and establish healthy attachments. Art making is an emotional experience, which allows for reflection
of deep emotions in the soul and sublimation of feelings into an art product. Art making can also be a spiritual experience that is created through ritual and ceremony. Farrelly-Hansen (2001) describes how art making is akin to meditation and how it can result in present moment mindfulness where suffering from symptoms falls by the wayside due to utilizing the senses during the engagement of the creative spirit. Kapitan’s (2010) recent publications of documented positive response to art therapy interventions has helped to solidify the healing potential of art therapy.

A strong therapeutic alliance with the trained art therapist is necessary to ensure the efficacy of art directives, which are designed to enable the client to work through feelings of helplessness and gain feelings of empowerment. Working with another person with whom the client feels connected and safe can result in the client developing enhanced resiliency and an improved ability to cope with problems related to life challenges. In the therapeutic relationship, the therapist and the client interact and engage in multiple ways. One of the therapist’s roles is to create opportunities for the client to learn how to relate to others in a healthy way.

In a therapeutic environment, the therapist goal is to create a safe space, in which the client can process his or her memories from the past. Experienced mental health clinicians who treat trauma related mental illness emphasize the importance of establishing an environment in which the client perceives as safe (Levine, 2010; Speigel et al., 2006; Talwar, 2007). Levine (2010) explains that a key foundation of creating a healing environment is to communicate to the client that the therapeutic relationship is a place where he or she can find “refuge, hope and possibility” (p. 75). It is necessary for an art therapist to remain calm and be a supportive facilitator of the healing process. The more the therapist is empathetic and grounded in present awareness, the easier it is for a
client to feel secure and safe enough to begin to work through his or her emotional pain related to past trauma. Only when an art therapist establishes a strong attachment between therapist and client does the process of transforming trauma experiences into useful beliefs and behaviors occur. The discovery of mirror neurons provides evidence of the power of the therapeutic alliance for healing.

In an influential article, Harris (2003) reviews the evidence that social behavior is governed by activation of certain areas in the brain. When the mirror neuron system was discovered in the 1990’s through scientific experiments with brain regions in macaque monkeys, it became widely considered to be one of the most significant advances in understanding how people relate to each other (Di Pellegrino et al., 1992). Mirror neurons are brain cells that activate both when engaging in actions that are executed by an individual and also when the same action is simply observed. Research with brain imagery showed that when one subject reached for an object and another was watching the action, the same areas in the observer’s brain fired as that of the subject who was actually performing the action (Di Pellegrino et al., 1992). These findings support the significant role the therapeutic alliance has in healing.

Heyes (2011) theorizes that there are biological functions at work within the brain when people engage in mimicry behaviors during interacting with others. She also argued that the mimicry behaviors are often automatic and take place on a spontaneous, unconscious level which she referred to as “automatic imitation” to describe this phenomenon. Harris (2003) discusses the role mirror neurons play in navigating human relationships and suggests that when people interact together a “mimicry” pattern develops which leads to increased rapport. The ability to empathize and relate with others
and see things from another’s point of view is a critical piece of successful social interactions (Kana, 2011; Williams, et al., 2001; Yuan & Hoff, 2008).

The implication of these findings are that once a client trusts and opens to the therapeutic alliance, they can then begin to investigate how his or her beliefs and behaviors are impacting mental health. Within the therapeutic relationship, the client can then feel safe enough to process whatever images surface during the art making sessions. Through creating and reinforcing a space of client-perceived safety, the art therapist can guide the client into movement of what Adler describes as “useful” behavior which is beneficial to self and others. Art therapy can cultivate healthy exploration of the impact of formative experiences on present day functioning in the occupational, social, and relational tasks of life (Adler (1933) as cited in Ansbacher & Ansbacher, 1956). Social behaviors govern much of a person’s perceived satisfaction with life and leads to success in navigating human relationships. It is important for individuals to relate to others in a socially cooperative way. Art therapy can assist clients with relational and social aspects of mental health through the engagement of the mirror neuron system.

**Art Therapy and Trauma**

Evidence points to the benefit of not only recounting a challenging experience in the past but also the importance of reframing those experiences as meaningful and connected to a core belief system. Art making can be a vehicle for the expression and externalization of deep and intense emotions and memories. Reclaiming the authorship and perceived meaning of past experiences through art making results in an increased sense of flexibility regarding reactions to external events. This increased flexibility and malleability transforms past negative memories from uncontrollably invading present functioning. Creativity engagement in art therapy has the potential to connect the
understanding of the impact of past experience on core limiting beliefs that may be impeding present functioning.

Through current research into the effects of trauma, it is now understood that the debilitating and persistent nature of PTSD may occur in individuals who perceive and identify themselves as a “victim.” Feelings of loss of control related to identification as a “victim” can become psychologically problematic. Through the task of “creative problem” solving exercises in the context of an art therapy session, a client who has experienced trauma has the opportunity to gain a sense of mastery and control. When given a “creative problem” to solve during an art therapy directive, a client has the opportunity to explore multiple solutions with the art materials. This exploration of solutions through art making can open the door for a broader conscious connection to identifying as someone who is capable and not a victim. Art making facilitates the recognition that the client has resources and skills available to cope with life challenges. Through reframing negative self-perceptions of helplessness, the client can begin to experience himself or herself as a resilient “survivor” instead of a victim.

Therapeutic art making increases client confidence in his or her ability to successfully solve a “creative problem” and confidence in the ability to solve and cope with psychological problems related to traumatic events and memories. With continued therapeutic art therapy interventions and further steps in healing, it becomes possible for the client to even self-identify as someone who “thrives” and not only “survives.” Art making, especially in a therapeutic environment, fosters feelings of control and power. Through the encouragement of self-expressive “power” over what was previously perceived as loss of control, the client can build a sense of hope. During an art therapy intervention, the client has an opportunity to express and externalize his or her inner
thoughts and feelings related to the traumatic experience as well the opportunity to process these thoughts and feelings though joining with an empathetic other, the art therapist.

The art therapist models empathy skills which research indicates can assist in the resolution of trauma. The capacity to empathize with another and to see from another’s point of view is a critical piece of successful social interactions and overall mental health (Kana, 2011; Williams, et al., 2001; Yuan & Hoff, 2008). Art therapists are trained to utilize techniques and skills that function to anchor the client in the here and now when the client is re-exploring past traumatic experiences. The art therapist’s active witnessing of a client’s healing process can be a powerful catalyst for the client to feel empowered to re-contextualize past traumatic experiences. Through art therapy new narratives and stories can be developed that ease the burdens of past troubling memories and negative self-perceptions.

Memory and Images

Intense unresolved experiences with trauma impact memory and perception of the past. Images from past experiences that are stored in memory are no different or less real in our perceptions than when our eyes receive actual visual inputs from the environment (Damasio, 1994; Riley, 2004). What we remember can hold as much significance in our conscious experience as that which we are experiencing in the present moment. This is one of the reasons why trauma is so challenging. Sarid and Huss (2011) describe the significance of imagery formation to psychological processing of experience, they state, “Images are a deep and universal psycho-neurological construct though which people process their experiences” (p. 252). Siegel (2010) theorized that when we experience an event, that event becomes a part of our understanding of the world and influences our

When events in the past are accessed, a complex chain of events occurs to retrieve information stored in the brain. It is hypothesized that memory formation occurs in two ways: memories encode in neural networks as “implicit” or “explicit” (Rothschild, 2000; Siegel, 2010; Talwar, 2007; Vance & Wahlin as cited in Hass-Cohen & Carr, 2008).

1. “Explicit” memory is often referred to as “declarative” memory because it is a recollection of a specific event, time, place, or concept, and from what researchers can determine, is associated with the left side of the brain (Rothschild, 2000; Siegel, 2010; Talwar, 2007; van der Kolk, 1994). Siegel (2010) describes explicit memory as recollections of specific events that are associated with the larger framework or “narrative” story or the overall perception of self.

2. “Implicit” memories are frequently referred to as “non-declarative” memories, and are comprised of automatic bodily sensations, reactions, and often do not engage conscious awareness or language centers. Implicit memory codes sensations of an experience such as the way something looked, sounded or smelled. Implicit memory also functions to encode emotions felt at the time an event takes place (Siegel, 2010; Talwar, 2007; Vance & Wahlin as cited in Hass-Cohen & Carr, 2008). We may not even be consciously attuned to how we feel at the time of the event, but none-the-less, the emotion is captured and stored in our implicit memory, often as sensory impressions, such as visual images. These impressions and stored emotions from events can then influence, on a subconscious level, the overall movement through an individual’s life, Adler’s "lifestyle" (Adler (1933) as cited in Ansbacher & Ansbacher, 1956). Adler believed that each person has a particular “lifestyle” and governing set of blueprints for
how to operate in the world. Traumatizing events can drastically impair healthy functioning in the world and can cause a pervasive sense of dread and unease.

Siegel (2010) theorized, that implicit memories have the capacity to shape or influence our subjective perceptions of what we experience in the present, but that we are often not consciously aware of this influence. He states, “we have to assemble these implicit puzzle pieces into explicit form in order to be able to reflect on their impact on our lives” (p. 154). This researcher believes that art making encourages the expression of what Siegel (2010) terms, an individual’s “internal images.” The outward expression of “internal images” helps the client begin to place the puzzle pieces of his or her implicit memory experiences into something he or she can relate to in the present. This is further facilitated by externalization of “internal images” within the context of a therapeutic art therapy session. Through art therapy, the clinician can guide the client to integrate his or her “internal images” of past traumatic events into associations that place the events in time and space in the client’s story of who he or she is.

Talwar (2007) states that, “In trauma treatment it is not the verbal account of the event that is important, but the non-verbal memory of the fragmented sensory and emotional elements of the traumatic experience” (p. 23). Art therapy provides the opportunity for the examination of perceptions of reality, past experiences, as well as internal images that may not be accessible to an individual unless there is a means by which they can be expressed (Riley, 2004). Art making is a powerful creative process that presents a possibility for expression of internal narratives.

Seigel, (2010) believes that in order to function with optimal health and well-being it is necessary to identify how all experiences fit together into the broader story and self-perception of a timeline when events occur and the significance they have on one’s
life. Seigel (2010) describes that when the “implicit” puzzle pieces are assembled into an “explicit” story that makes sense to the individual then they have the capacity to have mindful awareness or what he terms “mindsight.” Engagement of mind and body in the act of creation also leads to integration of past experience through tangible focus on art making and the resulting imagery related to past trauma that is created in the therapeutic setting of art therapy. As the individual creates imagery, the opportunity arises to incorporate “implicit,” unconscious and automatic thought patterns and perceptions about an event into images that incorporate the whole experience and understanding, not just fragmented sensations and images. With the assistance of the art therapist, the automatic and “implicit” patterns of thoughts and beliefs are revealed. Further dialog with an attentive art therapist creates the space for the individual to “make sense” of these revelations. The client-generated imagery acts as a catalyst, fostering the integration of implicit, automatic “puzzle pieces” of experience into healthy, comprehensive and useful behavior.

Summary

During the art making process in art therapy sessions, unconscious memories of past experiences may be revealed, brought into conscious awareness and expressed. While working with an art therapist, the client may then gain insight into how past events may be the root cause of the breakdown and problems with current functioning. Art therapy is effective because it bypasses the conscious “critical” mind and can quickly access subconscious memories. The subconscious mind acts as the storage unit for memories and the resulting beliefs that govern an individual’s behavior. While working with an art therapist, images can be externalized that relate to past events and can be placed and integrated into the appropriate places in conscious awareness. This meaning
making and understanding of past events can lead to healing from past traumatic experiences.

The next section will discuss the particular aspects of trauma that can result in a person re-experiencing an event over and over leading to psychological stress and pain. In the next section, this researcher will also examine the neurobiological mechanisms involved in the formation of trauma experiences into long-term patterns of deregulation of emotions and dysfunctional behaviors associated with PTSD.

**Posttraumatic Stress Disorder**

The *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000) defines posttraumatic stress disorder (PTSD) diagnosis as including a symptom model as follows: (a) re-experiencing the trauma, (b) effortful avoidance of trauma-related stimuli and (c) numbing of general emotional responsiveness, (d) and hyperarousal. Sarid and Huss (2011) state, “a traumatic event can be described as an event that involves actual or threatened death, serious injury, or a threat to physical integrity of self or other, to which the individual’s response involves intense fear, helplessness, or horror” (p. 8). As discussed earlier, it is known that through integrating past trauma experiences into a new and reframed association within the narrative story line, it is possible to reduce the level of psychological reactivity and increase the sense of safety and well-being. This may also lead to reversal of perceptions about trauma experiences and desensitize triggers related to them.

According to what is currently known about the development of PTSD symptoms, the impact of trauma on an individual can vary due to factors surrounding the trauma, such as: a) the intensity of the traumatic event; b) the duration of the traumatic event; c)
the level of perceived control of the victim over the trauma circumstances; d) if the trauma event is repeated; e) level of sensitivity of the victim (Tryon, 1998). Trauma can be categorized as Type 1 trauma, which involves only one event, and Type 2 trauma that occurs with repeated exposure to traumatizing events (Herman, (1992) and Terr, (1991) as cited in Tyron, (1991). According to the United States Department of Veteran Affairs National Center for PTSD approximately 60% of men and 50% of women experience trauma at least once in their life. Based on Statistics in the United States, approximately 5.2 million people have PTSD and 7-8% of the population will have PTSD at some point in their lives (U.S. Department of Veteran Affairs. PTSD: National Center for PTSD, 2013).

Highly intense experiences tend to result in intense visual memories that affix to an individual’s recollection of an event, however, the individual may have no conscious understanding or awareness of why. Intensity can be caused by associated feelings of terror, such as life threatening experiences in combat situations as well as when the physical body suffers pain due to injury. Combat veterans often develop symptoms of PTSD due to the considerable occurrence of both of these factors. van der Kolk, et al., (2005), state that “in the late 1970s, when hundreds of thousands of Vietnam veterans presented with serious psychiatric problems, a new diagnosis, posttraumatic stress disorder (PTSD) was created in an attempt to capture their psychopathology for inclusion in the *DSM-III*” (p. 389). Combat soldiers frequently serve more than one tour of combat and therefore are more than likely to experience repeated combat related traumatizing events. Collie, et al., (2006) estimate that 30% of all combat veterans develop PTSD and believe that this number is conservative due to veterans often not reporting symptoms related to PTSD. This under-reporting occurs due to the fear of the stigma associated with
a mental health diagnosis. A comparison between adult male combat veterans and non-veterans reveals a significant difference with the non-veteran population occurrence of PTSD estimated at only 5% (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995 as cited in Collie, et al., 2006).

Due to intensity associated with traumatic experiences, physiological response in the body is impacted. This physiological response stems from functions in the Central Nervous System (CNS) and creates “body” memories or “somatic memories” (Talwar, 2007; van der Kolk, 2003). In the CNS there are further systems which control body functioning. The Sympathetic Nervous System goes on-line during high intensity emergency situations enabling the body to react quickly it does so by increasing body functions such as heart rate and breathing rate and sends the “emergency alert” message throughout the body (van der Kolk, 2003). The Parasympathetic Nervous System serves to assist the body to recover from the heightened state and reinstate the baseline physiological functioning. When the emergency situation is over, the Parasympathetic Nervous System restores the CNS to normal function, the heart rate and breathing rates return to baseline. Problems recovering from trauma occur when the sympathetic nervous system does not go “off-line.” This hyper-vigilant, heightened arousal state results in the individual feeling as if he or she needs to remain on guard with high levels of feelings of anxiety and loss of control (Talwar, 2007). When the feedback loop between bodily somatic memory and present state functioning is turned on all the time, the individual experiences a perceived sense of threat and is unable to have a sense of well-being. This is one of the key symptoms of PTSD, hyper-arousal.

According to Levine (2010), an individual's ability to fully experience his or her environment through sensory means changes when involved in a highly intense and
threatening situation. He illustrates this point through the description of a hypothetical story of taking a pleasant morning walk and suddenly encountering a large snake on the trail. Through this example he describes changes in the individual's ability to perceive and interact with his or her surrounding environment when threatened. Levine (2010) describes that when in a threatening environment, perception and sensory awareness constrict to focus only on the source of the threat. He states, “most everything else retreats into the background, into the hidden crevices of your mind, so as not to distract you from what you must identify and do: to keep your attention solely focused on the snake and to slowly back away” (p. 143). The body physiologically reacts to provide the highest chance for survival. In essence what would normally engage thoughtful, conscious responses instead triggers an automatic and “quick” reaction. This is significant as the details of the experience are captured in memory, however, not in a conscious “explicit” way, rather subconsciously and “implicitly” for ease of recall if the events ever occurs again in the future.

Under the stress of extreme traumata, a person reacts with the fight-flight-freeze response. The body floods with the hormone cortisol, a chemical that has been shown to block hippocampal function. The hippocampus in the limbic region of the brain works with facts and specializes in language as well as episodic memory and it creates the “cognitive map” of an event (Talwar, 2007). The hippocampus works closely with the amygdala to encode the particular information of an experience and the emotions affiliated with that experience into memory. When the fight-flight-freeze response is initiated, the amygdala releases the hormonal chemical adrenaline (Siegel, 2010; Talwar, 2007). Anything that can temporarily shut down the hippocampus, such as extreme stress, can also block the formation of explicit memory (Seigel, 2010).
of adrenaline are present visual details, bodily sensations and feelings of fear and shock associated with the traumatic are burned into implicit memory (Talwar, 2007). Somatic “body” memories imprint sensations into the mechanisms of everyday functioning.

When implicit memory is not integrated by the hippocampus, the body sensations associated with the event remain in what Siegel (2010) refers to as “neural disarray.” Those sensations, feelings, and images are not coded as something that occurred in the past, but rather enter the awareness of the person experiencing them as if they are happening in the present (Siegel, 2010). Levine, (2010) emphasizes that memory formation of trauma events become “fragmentary snapshots” which morph into a narrow view and are a representation of the event resulting in repeating “intrusive images or Imprints” associated with PTSD (p. 142). It is necessary to focus attention to activate the hippocampus. Therefore, Levine (2010), states “defusing the adrenaline charge of the compressed "trauma snapshot” is necessary in order to uncouple associations that are symptomatic” (p. 142). Art therapy interventions may be useful tools to resolve the impact that the intruding “trauma snapshot” is having on the victim. If our unconscious, subjective perceptions about past events remain as “imprints” or “fragmentary snapshots” and are not integrated into an overall timeline and understanding of and individual’s experience, that person may continue to re-experience past events as real and happening in the present. This is often what occurs in PTSD.

Harris (2009) describes that survivors of trauma often report that memories of traumatic events are often felt as “amorphous sensations and images rather than linear narratives with explicit beginnings, middles, and ends… traumatic memories may intrude into awareness throughout a lifetime as vague impressions that are intensely felt yet little understood” (p. 94). Trauma is encoded differently than regular events that can be told
like a narrative story. Traumatic memory is not inherently verbal. It is felt physically. It is known emotionally. It is re-experienced visually. Yet, to prevent serious mental health issues from taking root, the brain must learn to analyze and understand the trauma as it does other events. As such, there is hope for healing in the sensory and visual experience of art making during art therapy.

**Dissociation and Flashbacks**

Another result of a highly intense traumatic event may be that the individual dissociates from the traumatic experience which acts to further temporarily disconnect the hippocampal functioning. During the dissociation, when high levels of stress hormones are released and explicit memory is blocked, the brain may find another object to concentrate on such as a detail in the environment that the trauma is taking place in, or by escaping into the inner mind of the imagination (Seigel, 2010; Talwar, 2007; van der Kolk, 2003). Seigel (2010) postulated that a “flashback” activates the implicit memories of an experience that include perceptions, emotions and bodily sensations from the past event and brings these subconsciously embedded experiences forward into present awareness without the association that they are coming from a past event. When an internal or external event “triggers” an automatic reaction, implicit-only memories flood the conscious awareness and the individual has the experience that the “memory” occurrence is happening in the present.

Seigel (2010) illustrates this point through his case example of Bruce, a Vietnam War veteran, who he was working with at the Brentwood veterans hospital. Seigel (2010) describes witnessing Bruce experience an intense flashback. He goes on to describe the complex details that Bruce is experiencing in his mind. Seigel explains that Bruce had pulled him under the table to “fight” in the war that Bruce believed was occurring right at
that moment. Seigel (2010) comments,

Bruce didn’t seem to experience that hour under the bed as something he was remembering, but rather as something that was actually happening in the present. He could also incorporate new items – the broomsticks, the cave under the bed, me – into the experience. This was more than becoming lost in a memory, or in imagination. Long-ago feelings, sights, sounds and behaviors had become alive in his mind and interwoven with his moment-to-moment experience. To me it was clearly a memory, but for him it had lost—or perhaps never had–some labeling in his mind that identified it as a recollection. Instead those recollections seemed to be a raw mental data, puzzle pieces of the past that had painfully exploded into his perceptions of the here and now. (p. 146)

Due to the intensity of Bruce’s experiences during his tour in Vietnam, his memories became dramatically imprinted on his mind and once triggered, flooded his present experience with an automatic feelings, body sensations, and reactions in the past, the fragmentary “snapshots” re-activated and became real to him. This is a survival technique in which trauma memories become associated with implicit functioning so these memories can be retrieved “automatically” should the individual find himself or herself in that particular threatening situation again. However, problems arise when there is no longer any threat for survival, yet the individual believes that there is and continues to operate in survival mode.

Much like Adler theorized when he discussed a person's “lifestyle” and mistaken beliefs, Levine (2010), describes how people develop a core belief system about self, others, and the larger world in order to easily move through life and communicate "inner experiences" to self and others. Levine goes on to describe that while most people have a
set of beliefs that govern all subsequent behavior, individuals who are traumatized have beliefs that "become excessively narrow and restrictive" (p.151). Levine (2010) believes that trauma which is not resolved forms strongly fixed associations related to the traumatic event and disassociations from current reality in maladaptive ways that continue to influence behavior until the source of the original trauma is identified, integrated into conscious awareness and transformed into useful information. Levine (2010) argues that the transformation of crystallized, fixed beliefs and behaviors based on past trauma experiences into integrated, flexible and fluid beliefs and behaviors restore an individual's ability to interact with experiences in life in a healthy and useful way.

One of the unique theoretical approaches that Levine emphasizes is building and restoring the client’s ability to move fluidly through all experiences in life. He proposes that establishing "pendulation" and a feeling of the normal ebb and flow of the emotional landscape is critical. Levine theorizes that a key aspect of successful therapy involves assisting a client to recognize the intrinsic movement between emotional states from fear and instability, or what he terms “contraction,” to “expanded” controlled states of stability and well-being. During art therapy sessions, the art therapist can guide a client to explore his or her emotional landscape and to recognize the peaks and valleys of emotional experience. Through the art making, the client can safely explore what differing emotional states feel like and, with the guidance of the therapist, can learn how to recognize emotional states with greater ease. In this way, the client can practice what it is like to have an elated “good” feeling as well as practice how to tolerate states of distress and internal dissonance. The client can begin to consciously experience “pendulation,” that no matter how much distress they may feel in a particular moment, that the feeling will subside and they will eventually move to the opposite state of well
being. The client can learn how to observe emotional states rather than attach to them.

**Transformation of Trauma Through Art Making**

The expression of feelings and emotions related to traumatic experiences has been identified as a key aspect of recovering from the debilitating aspects of PTSD. However, expression alone is not enough to facilitate comprehensive recovery from negative symptoms associated with PTSD; transformation of perception of the event is necessary. In art therapy an individual is presented with useful methods to modify and transform his or her perception of past traumatic events. To achieve changes in the client perception of traumatic experience, the art therapist guides the client to create a series of images related to memories of bothersome past traumatic occurrences. Sarid and Huss (2011) explore the concepts of how utilizing the formation of images created in the context of art therapy sessions can lead to changes in client perception of memories. They refer to clinical scientific research that indicates that memory is directly related to the images formed in the mind about the event. Sarid and Huss (2011) believe that when the imagery is restructured through things like composition then the “meaning and content” of what they term the “memory/image” can be altered (p. 253). Sarid and Huss (2011) corroborate with experts in the field of neuro-psychology that the level of intensity present during an event impacts the scope of the details captured by the mind.

A core theoretical model of memory formation that Sarid and Huss (2011) investigate explains that not only are images formed and recalled based on the level of intensity and emotional charge of an event, but that they are also filtered through the individual’s past experiences. Sarid and Huss (2011) go on to inform that the content of the “memory/image” is strongly relevant to the particular individual experiencing it, as “the mind explains what it sees through past experiences” (p. 253). Therefore, each
person is distinctive in his or her reaction to and memory formation of events that they experience. This is in principal due to a person’s past experience and the resulting assumptions that he or she makes regarding the meaning of such experiences. Since art making, by its very nature, encompasses the unique expression of the individual making the artwork, it then follows that art therapy interventions are effective at exploring the meaning and impact of memories. Through increasing client awareness of the meaning he or she associates with the expressed “memory/image,” he or she can not only tangibly see the negative impact of that “memory/image,” but also can find ways to resolve and change the impact on his or her life.

Summary

PTSD is a debilitating mental health disorder that affects millions of people each year in the United States alone. Art therapy is an effective method for treating PTSD through its unprecedented ability to assist in the transformation of negative associations to past images and memories related to traumatic events. Through working with a trained art therapist, memories and emotions related to past trauma can be identified and modified. Through the creation of imagery, attention and focus can be gradually shifted from the “contracted” states of emotional distress such as shock, horror, sorrow and pain often associated with trauma, to imagery and compositions that represent “expanded” elements of hope, stability and a sense of well being. This change of focus from pain and victimhood to the promotion of resiliency and identification as a survivor can lead to long-term recovery from mental health disorders such as PTSD.

The following discussion gives an introduction of the neurobiology of the brain and how thought patterns and behaviors are formed based on experience and perception of events and how they can be changed. It is necessary to examine how negative
“contracted” emotional states become normalized patterns of thinking behavior. The field of neuroscience has changed our understanding of the role emotions play in governing behavior.

**Neurobiology and Psychological Functioning**

Neuroscience is defined by the Merriam-Webster (2013c) as: “a branch (as neurophysiology) of science that deals with the anatomy, physiology, biochemistry, or molecular biology of nerves and nervous tissue and especially their relation to behavior and learning.” Neuroscience is a rapidly growing field due to advances in technology, which is providing avenues for scientific discoveries about how the brain works in relation to thoughts, emotions, creativity, perceptions, behavior, and health. According to the World Health Organization (2007), an estimated 1 billion people worldwide are affected by neurological disorders. Mental disorders affect approximately 44 million American adults alone each year and the cost of associated with these disorders is roughly $148 billion a year (World Health Organization, 2013).

Although scientists now have new ways of mapping different regions of the brain, there is still a great deal of information that has not been uncovered. New studies are underway aimed at understanding the full extent of the interconnectedness of mind, body and spirit (Hass-Cohen & Carr, 2008; Kapitan, 2010; Malchiodi, 2003; McNamee, 2006; Riley, 2004). From this point forward, the terms mind and brain will be used interchangeably. The importance of research in the field of neuroscience is critical to continue our understanding of the basis for behavior, motivation, the impact of psychological stress on the immune system and the vast array of complexities and mechanisms of the brain that impact and define us as human beings. The burgeoning field of neuroscience is bringing increased insight into the inner workings of the mind, body
and spirit. Now with exciting new research in the field of neuroscience developing there scientific backing as to the effectiveness of art therapy as a healing modality.

**Right-Brain, Left-Brain Functioning and Integration of Experience**

Research on the differing functions of the left-brain and right-brain hemispheres provides relevant and important information on the formation of memories and the origin of belief systems. This research is also informing the use of art therapy as an effective healing modality. Through the creation of visual imagery, art therapy can easily access emotions and memory stored mainly in the right hemisphere. Riley (2004) postulates that art therapy can assist a client in exploring the origin of his or her perceptions about events and experiences through offering them a way to express their “inner images” or in other words, Seigel’s (2010) “internal images.” This is accomplished by providing clients with materials and tools to create how they see the world.

Early childhood pre-verbal experiences are hard-wired into memory and shape how a person perceives the world. In the seminal split-brain studies published by Gazzaniga (1984, 1998), researchers analyzed the specialized functions of the left-brain and right-brain hemispheres by completing studies on patients whose corpus callosum had been split to prevent epileptic seizures. Those authors found that the right-brain is has a more literal, truthful conscious experience, while the left-brain is the inventive “interpreter mechanism.” From this brain research, it is understood that for the first years of life we experience the world through visual and somatic senses, and it is not until the third year of life that the right-brain and left-brain begin to become integrated and connected in their functioning (Franklin, 2010; Klorer, 2005; Riley, 2004). We first adapt and form *visual* images from our environment that we use to learn about the world. As language skills are developed, we can then *verbally* process the experiences of our early
formative years. These early years of life create much of how we perceive the world and our “emotional intelligence” or understanding about emotional experiences and the influence they have in present day decision-making (Franklin, 2010; Malchiodi, 2003; Riley, 2004).

At the conclusion of his research Gazzaniga (1994) referred to the left-brain as “the spin-doctor.” He describes the process in the unconscious areas of the left-brain that are able to be the “spin-doctor” and come up with explanations for everything, including things that can not be explained. McNamee (2004) takes it a step further with adding that due to Gazzaniga’s findings, one conclusion might be that because the left-brain hemisphere constructs a verbal story to explain experiences, the reliability of these explanations might be questionable.

As a result of these findings, many researchers in the field of art therapy have argued that art making has the remarkable ability to access unconscious memories and thought processes that are stored in the right-brain hemisphere (Bhattacharya & Petsche, 2005; Kapitan, 2010; Klorer, 2005; Metzel, 2009; McNamee, 2004, 2006; Neborsky, 2006; Riley, 2004; Zammit, 2001). In this way art therapy differs from traditional psychotherapeutic talk therapy because it does not rely only on story told by the left-brain linguistic “spin-doctor.” Rather the client’s own expression of his or her “internal images” or implicit memories as generated by the right-brain hemisphere might be closer to the core and truth of an experience (Klorer, 2005; McNamee, 2004; Riley, 2004; Zammit, 2001).

Through art making an individual is invited to explore his or her “internal images,” which are often deep, unconscious memories and experiences. Amalgamation of implicit memories begins with identifying significant experience housed in
subconscious in the right-brain and subsequent “joining” and engaging of the verbal left-brain hemisphere through processing insights and information within the context of an art therapy setting. Insight into formative subconscious experiences and memories further informs the client of the root causes of his or her problems with functioning. Art making acts as a bridge between the subconscious right-brain memories and experiences and conscious verbal left-brain experience. This type of “whole-brain” integration and holistic treatment of an individual can result in a deeper understanding of how unconscious, “implicit” and automatic memories may be influencing behaviors that may be negatively impacting functioning. These automatic “implicit” perceptions and thoughts contribute to what Adler termed mistaken beliefs about self and the world, Adler believed that uncovering and making conscious an individual’s mistaken beliefs was akin to “spitting in the soup” which makes the continued use of such behaviors unappealing and unpleasant (Adler (1936) as cited in Ansbacher & Ansbacher, 1956).

Adler theorized that once an individual is made aware of how his or her core guiding beliefs are “mistaken” and dysfunctional, it becomes less appealing to continue to believe thoughts and behave according and related to those beliefs. The “soup,” or underlying belief, doesn’t seem attractive to consume once it has been spit in. Adler also theorized that useful behaviors, garnered from healthy core beliefs result in mental health and wellbeing (Adler, 1936, as cited in Ansbacher & Ansbacher, 1956). As an individual gains insight into how belief impacts behavior there is increased opportunity to recover from mental illness.

Creativity engagement through art making leads to growth and changes in thought patterns in the brain and can alter dysfunctional behaviors. Art making in a therapeutic environment can create changes in neural network connections as well as increase
cognitive flexibility. As options for solving a “creative task” problem expand during the creative process, so do opportunities for neuroplasticity and long-term changes in neural networks in the brain. During the creative process, neurons are utilized and connected in new ways that were not previously connected, therefore increasing possibilities for change and increased healing opportunities.

During art therapy sessions, new ways of thinking, and the resulting beliefs related to perceptions that govern behavior have the potential to change immensely. New paradigms of belief and thinking patterns can result in an expanded perception and belief about self, or internal processes, and the world, or external stimuli. With repetitive use of new perceptions and beliefs, long term changes in behavior result. Art therapy can help clients to shift into new paradigms of beliefs. With continued art therapy sessions, clients can "practice" thinking, perceiving and behaving in new ways without their previous mistaken and limiting beliefs. From what is known about how the brain works, with repetitive use, thought patterns in the brain can change significantly. Positive and constructive beliefs that correlate with useful behaviors result in good mental health. It is necessary to understand how these long-term changes actually occur in the brain.

The next section will discuss the basics of neurobiology and how change occurs at a neuronal level. Also discussed, will be how new neural pathways of useful and constructive thinking can be created during art therapy to aid in long-term healing and recovery from disorders such as PTSD.

**Neural Anatomy and Functions in the Brain**

Neurons in the brain are the information processing centers of our body. Neurons complete this task by receiving and sending electrical signals as both stimuli and response, running into or out of the central nervous system (CNS). There is a constant
ebb and flow on an interconnected highway of messages that are sent back and forth from our body to our brain and vice versa which in turn influences our every thought, perception, emotion and behavior. Neural networks combine similar singular neurons into a group or network that efficiently communicates information through chemical or electrical signals. According to what neuroscientists have been able to determine at this point, there are approximately 200 billion neurons and over 10,000 types of neurons in the brain (Berlucchi, 2011; Stufflebeam, 2006). Some of the most relevant neurons are those which convey motor and sensory information, and also neurons that connect information between differing types of neurons (Berlucchi, 2011; Schwartz, 2002; Stufflebeam, 2008).

The anatomy of a neuron includes the cell body, also referred to as the Soma, a mass of dendrites, the axon, and the synapse. The cell body essentially functions similarly to that of any other kind of cell, in that it manufactures proteins and also acts as the “metabolic control center” (Stufflebeam, 2006). Information is conducted through a course of action that moves signals to or away from the cell body; dendrites act to receive energized, dynamic communications that are incoming from other neurons; axons are responsible for transmitting outgoing messages to other neurons; the synapse is the area which connects neurons to each other and is where chemical communication takes place (Berlucchi, 2011; Schwartz, 2002; Stufflebeam, 2006).
Synapses are defined as the fluid filed gaps between neurons (Berlucchi, 2011; Schwartz, 2002; Shufflebeam, 2006). This is the location of communication between neurons. Neurons communicate with each other either through electrical or chemical means. Chemical communication between neurons occurs in clefts between the axon terminal of one neuron and the dendrites of another. Electrical communication transmission occurs between dendrites at electrical synapses and does not involve the flow of information through the axon (Shufflebeam, 2008).

Neurotransmission takes place at synaptic gaps between one neuron and another. Neurotransmission is the mechanism or catalyst necessary to transport a signal from one neuron to another. Neuroscience research is indicating that the means by which neurotransmitters transport signals from one neuron to another through the synapse might explain the impacts that the brain has on the behavior of an individual.

The significance of this research has long-lasting implications towards understanding the complexities that govern and influence the human psyche. Chemical communication travels down the neuron through the axon, cell body, and dendrite, arrives at the synaptic gap and through a process of triggering the stimulation of calcium
ions, results in neurotransmitters released, such as Dopamine, Serotonin, Epinephron, Norepinephrine, Acetylcholine, and Histamine. (Berlucchi, 2011; Schwartz, 2002). Some people are familiar with the role neurotransmitters play in mental health such as Dopamine and Serotonin due to recent discussions and advertisements for psychotropic medications, which describe how the imbalance of these neurotransmitters in the brain can contribute to disorders such as depression.

Neuronal regions, such as the soma, axon and dendrites are intricately interconnected and dependent on appropriate chemical signals in order operate at maximum capacity and efficiency. Dendrites, of which, there can be thousands, branch out from the cell body, and can have a multitude of connections (Berlucchi, 2011). The visual structure of neural networks in the brain resembles highly complex free branches. Dendritic “spines” sprout from dendrites and have the ability to modify in size and shape as well as appear and disappear based on their use and inputs from other neurons (Berlucchi, 2011; Shufflebeam, 2006). Dendritic spines can be compared to small branches sprouting from a larger branch system and again can be visualized as a tree. Dentritic spines thrive and grow when used. Berlucchi (2011) states,

The responsiveness of a neuron to its synaptic inputs is subject to a continuous regulation by the turnover and replacement processes of its dendritic spines, as well as by their momentary changes in shape and size. Moreover a neuron’s synaptic projections can be extended to previously unconnected neuronal targets by the process of axonal sprouting aimed at both old and newly formed spines. (p. 565)

Neuroscientists are continuing to examine the function of dendritic spines and their capacity for modification, and this is the basis for the study of the physiological
mechanisms of neuroplasticity. It is now accepted that the organization and connectivity of neurons is the result of changes in dendritic spines (Berlucchi, 2011, Schwartz, 2002). These changes to the size and shape of dendritic spines, the growth of new dendritic spines, or the elimination of dendritic spines are based on chemical and electrical stimulation from other neurons. This is the core foundation of understanding how environment can impact the brain.

It is well known that enriching environmental experiences have significant impact on dendritic spine formation (Berlucchi, 2011; Schwartz, 2002). Begley (2007) believes that "denser synapses and more dendritic branches add up to richer and more complicated brain circuits. The structural difference produced behavioral differences" (p. 57). This background information into the neurobiology of the brain is important groundwork to understanding the role that creativity engagement plays in neuroplasticity. Creativity engagement during art therapy is an intrinsically enriching experience. When an individual is engaged in art making during an art therapy session, the opportunity for new connections between branches of dendritic spines is amplified. The creative stimulation triggered during art making generates positive growth environments between dendritic spines and branches.

Another aspect of communication at a neuronal level is the mechanism for how singular neurons respond and connect to each other. Electrical neurotransmission creates connections between dendrites. Electrical neurotransmission is fluid, and creates connections between neurons at dendritic gaps when two dendritic spines are next to each other. Electrical neurotransmission allows for neurons to be physically joined together, which results in one gigantic neuron that function together as a mini network and fires synchronously (Berlucchi, 2008). The fluid connectivity of electrical neurotransmission
links neurons together to “fire” together automatically, and implicitly. As discussed earlier, implicit processes allow a person to function automatically without conscious thought. Actions such as riding a bicycle, driving a car, or brushing teeth do not require conscious thought, they are fluid, and are implicit. Explicit functions require deliberate and thoughtful decision-making and can be described is crystallized, or specific, such as explicit memory is memory of a specific event.

It is necessary to utilize automatic implicit functioning in order to be able to focus attention on events that may be occurring simultaneously in an experience, such as when driving a car. One needs to engage implicit memory to be able to perform the functions of operating the vehicle while at the same time focus conscious attention to variables of that particular event. Variables can include navigation, and interaction with other drivers that engage explicit functioning and require conscious thought and decision making. Therefore, the significance of having certain functions performed fluidly on a daily basis would allow for an opportunity to experience new information during an experience. The individual has an opportunity to not only experience an event but also to synthesize the occurrences of the event and frame these occurrences as, either congruent and matching with past experience, or as something new and uncharted. When stimulating new events occur, the brain has an opportunity to change and grow. The next section will discuss neuroplasticy and how changes in the brain create changes in behavior.

**Neuroplasticity and Art Therapy: Art Making as Catalyst for Change**

Neuroplasticity of the brain involves dynamic network connectivity. According to neuroscience research, neuroplasticity is a model of the brain in which dynamic neuron pathways can be changed according to environmental input and stimulation (Berlucchi, 2011; Shufflebeam, 2006). The basic function of neurons in the brain is to send and
receive information in a neural network system. This system involves both input and output of information originating from physiological body response to factors in the environment. Neuroplasticity is defined as the ability of the brain to change through responses to external or internal events or stimuli and reorganize and restructure neuronal pathways or connections (Ruge et al., 2012; Schwartz, 2002). According to Ruge, et al. (2012), neuroplasticity “can be experience-driven, is time sensitive, and is influenced by the environment and internal states, such as motivation and attention” (p. 5705). The brain and therefore an individual has the potential to change through exposure to and interaction with external events such as those that occur with art therapy interventions.

Hebb (1949) was one of the first psychologists to theorize that environment could impact behavior by suggesting that synaptic activity could produce changes in neuronal structure and changes to neural networks (Ruge, et al., 2012; Schwartz, 2002). This is the foundation of the theoretical approach that enriched experiences in a child’s development are critical to brain development and efficient brain functioning. Information regarding the interconnection of environmental stimuli to normal brain development has been gleamed from studies of children who were raised in Russian orphanages and had very little stimulation or interaction with caregivers (Robb, 2002). These studies revealed the importance of experiencing enriched, varied, and novel environments to develop the capacity for intellectual functioning and social/emotional functioning. Also discovered, that not only are novel experiences important for high levels of neuronal connectivity, but human interaction and presence in these experiences is critical (Robb, 2002).

For an individual to develop an ability to relate to others, to communicate in socially appropriate ways, and to develop empathy, environmental and intellectual stimulation is necessary. Dispenza’s (2007) discusses Hebb’s hypothesis of
neuroplasticity, he states,

Hebb’s hypothesis: when two connected neurons at a synaptic junction are repeatedly triggered at the same time on several occasions (either by learning new knowledge or by experience), the cells and the synapses between them change chemically, so that when one fires, it serves as a stronger trigger for the other to fire as well. The once - unstimulated neurons become partners, and in the future, they will fire off in tandem much more readily than before. (p. 224)

Dispenza (2007) goes on to describe that when we are exposed to new pieces of information we expand our neural networks and begin to relate new things that were previously unrelated to each other. He describes areas in the brain and neural networks as going online or being “turned on.” He hypothesizes that "it is easier for us to make a new addition in any part of the brain when circuits are alive, turned on, and electric" (p. 225).

This speaks to the significant role that creativity plays in "turning on" or expanding connections between neural networks (Dispenza, 2007). This researcher hypothesizes that when the brain engages in stimulating activity, such as in an art making experience, there is greater potential for large sweeping changes in neural firing patterns. Begley (2007) states "it has become a truism that the better connected the brain is, the better it is period, enabling the mind it runs to connect new facts with old, to retrieve memories, and even to see links among seemingly disparate facts, the foundation for creativity" (p. 69). Repeated exposure to new concepts and ideas through creative and “electric” phenomenon intrinsic to art therapy sessions allows for greater opportunities for the activation of the “circuits” in the brain, resulting in the "wiring" of new neural networks.

This researcher speculates, that how an individual perceives himself or herself,
how he or she responds to external events, interacts with others, and solves problems is directly correlated with enriched, empathetic, and stimulating interactions with his or her environment. In the past, neuroscientists believed that once neural nets were formed, they could not be changed or grown. Now it is known that this is not the case. In the 1990s Elizabeth Gould and her research team provided significant evidence that neurogenesis and the capacity for the propagation and modification of neurons occurs even into the later stages of life (Begley, 2007). This researcher speculates that when engaged in a creative activity such as art making, the opportunity for changes in neural pathways is heightened.

Begley (2007) describes neuroscientist Gage’s discoveries of neurogenesis and neuroplasticity in mice exposed to enriched environments, she says "it was one of the most striking findings in neuroplasticity, that exposure to an enriched environment leads to a striking increase in new neurons, along with a substantial improvement in behavioral performance" (p. 58). Another factor that was discovered to relate to neuroplasticity is the ability of the individual to recognize new variables in an environment. In examining the brains of individuals with depression the hippocampus region in the brain is significantly smaller. Optimal growth and use of the hippocampus is the key in recognizing new experiences. Through her research into the phenomenon of the brain’s ability to change, Begley suggests, "people who are suffering from depression are unable to recognize novelty" (p. 60). Begley believes that the ability to recognize novelty is an important aspect of mental health and that novelty recognition leads to neuroplasticity (Begley, 2007).

The argument that art making fosters neuroplasticity is backed by the notion that there is a wide range of novelty exposure available when utilizing art materials and this
can lead to innovation. Lusebrink states, “An expression through art media can also originate from complex cognitive activity involving decisions and internal imagery, thus activating the sensory channels and motor activity” (Lusebrink, 1990 as cited in Lusebrink, 2004, p. 192). For example, with painting alone there are endless possibilities of how materials can be used: to explore a multitude of types and colors of paint; to feel differing textures of paper and canvas; to utilize various shapes and sizes of brushes; and to learn and practice new painting techniques and options for applying paint to paper or canvas. All of which can be utilized to facilitate endless possibilities of types and content of expression, and which result in activating “sensory channels” and fresh and unique ways of thinking, neuroplasticity.

The following is an illustration of this theory using the metaphor of engaging in the sport of cross-country skiing. During an initial run through freshly fallen snow, the skier may be challenged with laying down a new “ski track” and “pathway,” however, once a new path through the snow is started, each subsequent use deepens the “grooves” in the snow and becomes easier for the skier to transverse. Each time a skier uses that trail, the path becomes straightforward to navigate due to the snow packing down and smoothing out even more. Eventually the skier is able to travel across the surface of the path with great ease. As the skier moves along the path, he or she is able to move faster and faster and more efficiently to the destination (J. Froemming, personal communication, January 10, 2012).

This illustrates the concept of the “use” of neuronal pathways. Through the partnering and joining of neurons, which “fire” together, and access long-term potentiation, neurons join in a “long-term relationship” and become robustly wired neural pathways. The “grooves” in the brain increase, deepen and smooth out, resulting in
efficiency of use. These smooth and efficient pathways subsequently produce changes in the individual’s patterns of thinking, perceiving and behaving. The long-term relationship in the brain to positive and useful “circuitry” become second nature or automatic, “implicit” and without effort. Therefore, behaviors, that result from and follow with the new “circuitry” become automatic, “implicit” and without effort. Repeated sensory art experiences during art therapy sessions, such as: utilizing brushes on paper to create a self portrait as a superhero; drawing a meditative mandala with chalk pastel on black drawing media; Sculpting a “totem” animal to represent the individual’s strengths, contribute to the formation and strengthening of neural pathways and memory (Hass-Cohen & Carr, 2008). Repeated purposeful art therapy interventions designed to facilitate positive therapeutic formation of new thought patterns change behavior.

This theory supports the efficacy of art therapy because through repetitive therapeutic sessions using art interventions, new self-perceptions can be formulated. Where once the constant reinforcement of the repetitive identification as “victim” of trauma was present, new re-imagined and shifted self-identification, as “survivor” is possible. Through art therapy interventions and the continued use of positive and useful neural pathways of thinking, it is even possible to change to perceiving self as one who “thrives,” not just “survives.” Therefore if a person who is suffering from PTSD symptoms is exposed to new coping tools through art therapy interventions and then repeatedly has an opportunity to practice these new skills, he or she can heal. This happens through integrating the trauma experiences into the larger positive and useful “story” and self-identification of health and wellbeing. Through the healing process presented through art therapy, a client can self-identify as one who has “recovered” from trauma, one who has “survived” and one who can “thrive.”
A Counter Argument

In a commentary article, Johnson (2009) discusses the interest creative arts therapists have of linking neuroscientific advances to the field of art therapy. Johnson (2009) postulates that it is harmful to the field of art therapy to search for scientific “proof” which legitimizes the work that is done in art therapy. He believes that there are problems with the paradigm of utilizing neuroscientific explanations for the effectiveness of art therapy. Johnson (2009) writes that art therapists tend to simplify the complexities in brain systems when applying them to supporting the positive effects of creative art therapy sessions. Johnson (2009) believes that the argument of right brain/left brain processing and its ties to nonverbal expression during art therapy sessions is faulty because of its reliance on the clear distinctions between the two hemispheres. He argues that this distinction is not accurate and states, “both sides of the brain are active in every human endeavor” (p. 116).

While Johnson (2009) has some relevant counter arguments, his position oversimplifies the reasons why art therapists may seek an alliance with research in the field of neuroscience. He believes that in order to justify the use of creative arts in the field of psychology, mental health providers blindly embrace “trendy” paradigms without thought to the consequences. However, this researcher argues that advances and discoveries in neuroscience, such as the increased understanding of neural network connections, mirror neurons and neuroplasticity have direct correlation to and confirmation of art therapy as a highly effective therapeutic model.

Summary

In an art therapy treatment program, the therapist can not only model appropriate interactions with others, but help to shift the way an individual may be approaching and
interacting with their environment. Research in the field of neuroscience is relevant to the field of art therapy because it provides information of how art making in a therapeutic environment can help clients to form new healthy thought patterns and behaviors while at the same time eliminating behaviors that are socially detrimental to successful functioning. Further research exploring the link between neuroplasticity and mental health may continue to confirm the efficacy and importance of art therapy as a healing modality.

As novel ways of coping with the detrimental aspects of PTSD are introduced through art therapy directives, the client has the chance to repeatedly utilize new coping skills and to potentially recover from PTSD. The intrinsic novelty exposure involved with the creation process sets up increased opportunity for change in client thinking patterns. As the client continues therapy, he or she can learn to recognize how his or her "implicit" and unconscious memories of trauma are not integrated into an understanding of the narrative “story” of his or her life.

With continued utilization of art making in a therapeutic environment the client can integrate the "puzzle pieces" of what happened to them during the trauma, why it is significant to present day functioning, and what can be done about it. Through directives designed for expression, as well as integration, the person can truly change how they perceive themselves and the world around them. This in turn changes behavior and leads to long-term healing and recovery. Specific discussion of case studies illustrating the debilitating nature of PTSD as well as how art therapy interventions can be an effective healing modality will be discussed next.
Case Examples: PTSD and the Soldier’s Story

The affects of combat on veterans when they are relieved of active duty and reinserted into civilian life is illustrated in an interview with a Marine Corps veteran about his post-war life. Capt. Jason A. Haag, was discharged from the Marine Corps for medical reasons after serving over ten years and three tours of services, one in Afghanistan and two in Iraq. When deployed for the first time, Haag was 21 years old, married and a father of a 6-month old child. Before deployment, Haag was a typical American young man, excited about a bright future and beginning the journey into being a husband and father with his high school sweetheart.

Haag wanted to enlist in the Armed Forces, as an honorable and respected career choice made to support his family, and happily went to combat for the U.S. Marine Corps. Haag’s wife, Elizabeth, supported his choice although she reflected after his return that she “had no way of knowing that the young husband who did finally return would be markedly changed from the lively, gregarious man she had married—sullen and withdrawn, sleeping with a loaded gun, drinking a 12-pack to get to sleep, haunted by nightmares of the war” (Watkins, 2013, para. 5).

Combat did change Haag. It prevented him from successfully “re-entering” his former “civilian” life. Watson (2013), the author of the article, describes that one of the most distressing factors in Haag’s readjustment to his civilian life was the coming to terms with “how easy it was to kill.” In his own words Haag states, “I did not hesitate, not for a second, never blinked, didn’t think twice about doing my job … I pulled the trigger as easily as you click your mouse button or get a glass of water” (Watkins, 2013, para. 13). Haag reflects on his effortless ability to kill another human and the unbearable
implications of his actions by questioning if he is “some kind of monster, devoid of any emotion” (Watkins, 2013, para. 8).

Through the interview Haag describes that he continues to struggle with not being able to integrate his “soldier” identity, whom he had to be while in combat, with who he is now after his service has ended and he is a “civilian.” In the article, Haag reports pervasive and horrid flashback memories of his experiences during his time as a soldier. Haag describes his continued fears and dysfunctional mental state as a result of his multiple tours of combat. As the interview continues, Watson describes how Haag experienced “sniper attacks, sporadic firefights, IEDs, blistering heat and sleeping on the hard desert ground” on a daily basis. The interview continues by further describing Haag’s experiences, when he writes,

He (Haag) said he stayed in a constant state of hyper-vigilance and exhaustion.

Back home, that intense hyper-vigilance would continue. In Iraq it helped keep him alive. Back in the States it proved crippling. It would have him swerving across two lanes of busy traffic on Interstate 95 to avoid a plastic bag that blew onto the highway—a possible IED in Haag’s mind. It would have him avoiding crowds, unable to eat out with his wife and often unable to attend his three children’s sports events, school plays, and dance recitals. It would have him pulling a gun twice—once to threaten someone who’d smashed a bottle on his truck outside a bar, once to flash at an angry driver. (Watkins, 2013, para. 15).

Unfortunately, Haag’s story is not an anomaly among combat soldiers returning from war. As illustrated through the above example, significant problems occur when a soldier returns from war, attempts to take off the “soldier mask,” yet, due to the intensity and traumatic nature of his or her combat experiences is not able
to do so. As is often the case with combat related PTSD, physiological functioning mechanisms of the body necessary to react automatically and survive during combat persist and continue to be activated even though the original sensitizing events occurred in the past. Past body and “somatic” memory experiences continue to flood into present consciousness and are unable to be integrated to the individual whole and the post-war style of life.

The soldier, who suffers from PTSD, often faces impairments due to multiple factors, including dealing the after effects of the dissociative nature of trauma in war. Even though past traumatic experiences in combat need to be put aside when returning to civilian life, without help, veterans do not often have the training or skills to resolve deep internal conflict caused by dissociation on their own. When enlisted into the armed forces, individuals are trained to become “soldier” and potentially wear the “killer” mask, however, they may not be trained on how to not only take it off once service is complete, but then also to be at peace about having worn it. There is limited or sometimes non-existent direction on how to integrate the past “killer” identity with the present identity of diplomatic civilian. Optimistically this is beginning to change. As more research is completed, on the effects of combat on veterans and the debilitating aspects of PTSD, the effectiveness and relevance of art therapy interventions becomes clearer.

In a study conducted in the Creative Arts Therapies Department of Concordia University (2013), veterans from Afghanistan and Iraq, who suffered from a variety of dysfunctional psychological and physical symptoms such as depression, suicidal thoughts, anxiety, chronic pain and insomnia were offered art therapy twice a week as a
part of a recovery program. The results of the study indicated that the art therapy interventions appeared to lessen both the psychological as well as the physical symptoms of PTSD. In the article, the effectiveness of art therapy is described as fostering the ability to creatively express and revive positive feelings while tackling symptoms such as emotional numbing common in PTSD.

Due to the high incidence of combat related PTSD, the United States Department of Defense has even begun to implement interventions for active-duty and retired troops who sustain Traumatic Brain Injury (TBI) and who have mental health issues. An example is the special treatment and intervention program through the National Intrepid Center of Excellence (NICOE) at Walter Reed National Military Medical Center. A part of the program entails using art therapy interventions to help soldiers cope with the devastating effects of combat. One such art therapy intervention is the “creation of masks.”

During his term at the NICOE program, Maj. Jeff Hall of the U.S. Army was one of hundreds of active-duty soldiers who participated in the art therapy program. He created a mask with part of the skull of the head missing, with a serrated and damaged space saturated with red paint in its place. The eyes are depicting a person with extreme fear. The image was that of an Iraqi man who made eye contact with Hall just a few minutes before he was killed. Hall described that the face of the man had tormented him for five years since those days in combat. Describing his process and experience in creating the mask during his art therapy sessions, Hall states, “that image, seared into my mind, began leaking out of me. I almost needed to regurgitate it. To be honest, it helped me let it go” (Briggs, 2013, para. 3).

**Case Example: Meaning Making through the Expression of Art**

As part of an internship experience and prior to completing research for this Master’s Project, this researcher began working with a client diagnosed with PTSD. The client, John (name changed) has past sexual abuse by his grandfather, as well as from the traumatic experience of witnessing the suicide of his best friend while they were both in the United States Navy. Art therapy sessions have provided an opportunity for John to begin to express how his past traumatic experiences severely and negatively impacted his daily functioning. To escape the intruding memories and flashbacks from his past, he began abusing alcohol and drugs and became an uncontrollable alcoholic. After witnessing his best friend, whom he had enlisted in the Navy with, commit suicide, he de-compensated and had a psychotic episode resulting in his dishonorable discharge from military service. With no employment, declining mental health and addiction to alcohol, John began prostituting himself to live and to buy more alcohol. As time went on, he became more and more dysfunctional and had another psychotic episode that resulted in
his eviction and he became homeless. John knew he needed help and checked himself into a hospital mental health ward. Upon discharge, John was sent to live in a group residential home and several years later still lives there. The group home provides John with the stability he needs. John is in recovery from his alcohol addiction and participates in daily Alcoholics Anonymous meetings. John also engages in regular therapy sessions with this researcher.

Upon meeting John and gathering information regarding his mental health symptoms and his past history of abuse, this researcher began with first developing a trusting therapeutic relationship. Initial art therapy sessions utilized enjoyable and meditative art directives, such as coloring mandalas. As the therapeutic progress continued and John began to perceive a sense of safety, he started to create images related to his past sexual abuse. One particular image was of a dark cloud covered over in red created with crayon. John described the dark cloud as his past memories and his feelings about being sexually abused by his grandfather. John created several abstract images all with large dark scribbled areas. The art making session had given John a way to begin to understand how his past was impacting his perceptions of himself and the world around him. The expression and externalization of his emotions regarding his abuse in the presence of this researcher validated his experiences.

During the art therapy sessions, the John remained in control of the depth of revealing his abuse history. Lusebrink (2004) states the benefits of using art therapy with victims of trauma, “a possible resolution of traumatic memories could be directed through a paced approach with art media without emotionally overwhelming the individual” (p. 130). When John seemed to be overwhelmed or highly anxious, the use of
making mandalas was again utilized as John had expressed how he found the coloring of mandalas comforting.

After time, John’s dark abstract images began to transform into images about the environment and the place the abuse happened, his grandfather’s shed. The shed was drawn in a rudimentary fashion, and as before with the cloud images, was drawn in dark colors with red over the entire paper. As John continued in the art making process, the imagery about the shed lessened. John also reported that the power that the “internal image” of the dark shed had over him lessened too. Up until that point, John said that he could not describe what had happened to him. The drawing process allowed John to feel a sense of power and control over the intruding memories that he previously felt he had no control over. Making drawings related to the abuse provided tangible objects of artwork that he could see and feel.

These tangible concrete drawings provided a chance for John to share his feelings of fear and deep sadness over his childhood abuse with a safe “other,” this researcher. Having control over the art materials and the image making transformed his implicit memories of helplessness. The concrete drawings of the place of abuse changed the fleeting abstract implicit-only memories into an accessible form that John could then identify and integrate into his explicit memory of that time in his life. Through depicting where the abuse occurred and how it made him feel, John was able to “place” the events into a location and to also “place” the events into the narrative timeline of his life. John’s artwork gave him a chance to express to an empathetic “other,” in the context of a therapeutic environment, his feelings of loss of control and helplessness.

The ability to share with an empathetic other and have a tangible means to do so enabled John to modify his belief and association as a helpless victim. Through additional
art therapy sessions, which explored John’s strengths and resources, he was able to develop a greater sense of self-esteem. John’s expression of his implicit memories that had previously manifested as disturbing and intrusive flashbacks allowed him to begin to unravel the compartmentalization and rigidity that was causing him difficulties as an adult. John’s fear of having a flashback and remembering the abuse had caused him to often dissociate and compartmentalize different aspects of his daily life. This compartmentalization was apparent through John’s artwork. When creating images, the separate objects rarely touched each other. For example, if John was creating a landscape, and included a tree or a lake, there was often no grounding line, and the objects “floated” in space on the paper with very little reference to each other. Due to his compartmentalization in his life, John had difficulty with forming healthy relationships.

Through joining with this researcher in art therapy sessions John began to understand that the abuse had occurred in the past and that it did not have control over him as an adult. John’s exploration of the separation and denial of his past and his present provided him with insights. With pacing from this researcher and the focus on John’s resiliency and strength, he began to believe that he had internal and external resources available to support him. In John’s artwork, the previously compartmentalized objects began to become more integrated, with grounding lines, and “blue sky” joining them. Aspects of himself began to become integrated too. He could talk about his past, but rather than flip into a dissociated state, he would maintain his boundaries and stay in the present. John began to see his strengths and resources increased and as a result, he ceased to continue defining himself as a “victim.” Rather, through the expression and integration of his trauma experiences, he began to define himself as a resilient, “survivor.” With continued processing through art therapy sessions, John is now
“thriving.” John learned from a therapeutic relationship how to adapt, understand, and cope with his life stressors that previously lead to him to unhealthy behaviors and thinking patterns.

**Psychological Identity and Mental Health**

This next section discusses the relevance of an “individual whole” or what could also be termed psychological identity, and how the art therapy intervention of mask making serves to the explore the role identity plays in mental health. First, a groundwork discussion of identity will proceed. Psychological identity can have many interpretations. It can be described as actively transient and changeable, influenced and modified by formative events, as well as, a fixed personal character that remains unchanged and is formed early in life. According to Merriam-Webster Online (2013a), identity is defined as follows: a) sameness of essential or generic character in different instances; b) sameness in all that constitutes the objective reality of a thing; c) the distinguishing character or personality of an individual; d) the condition of being the same with something described or asserted. This researcher proposes that even though essential character may stay somewhat the same, parts of an individual can change throughout life based on influencing experiences. In this way, identity could be likened to Adler’s “individual whole,” and is malleable.

Since the individual is goal directed as Adler theorized and strives for perceived improvement and success, "identity" may change given to variables in the environment. As an individual moves through life it may be necessary to “put on” and “wear” differing identities for survival. The trajectory towards the end goal may change given changes in the external life of the person or the end goal itself may change given life experiences.
Differing “identities” or what Carl Jung terms “personas” can occur in the same person. Jung (1937) as cited in Storr (1983) states,

The persona is a complicated system of relations between individual consciousness and society, fittingly enough a kind of mask, designed on the one hand to make a definite impression upon others, and, on the other, to conceal the true nature of the individual. (p. 94)

Jung theorizes that the persona or “mask” that an individual wears can be divided and split from the unconscious self and that ignorance of this phenomena can cause suffering in the individual. Therefore, one of the purposes of the art therapy intervention of mask making would be to bring insight into all aspects of a person and the “masks” an individual might wear given differing environments. Storr (1983) sums up Jung's definition of the archetypal nature of individuality or “identity,” and discusses that even though it may be ideal to have one steady persona, “in practice, most human beings adopt attitudes in public which are different from attitudes in private. There is a dissociation of personality into "outer" and "inner"; into "mask" and "soul" (p. 97).

This dissociation of “outer” and “inner” is where the crux of dysfunction may begin with individuals who have suffered from PTSD particularly combat veterans. Feelings of dis-ease and discomfort arise as differing aspects of a person’s identity appears to be incongruent and the person is not able to integrate the identities. The person may also have no conscious awareness of this phenomenon as the problem itself. Jung (1937) as cited in Storr (1983) describes, “what goes on behind the mask is then called "private life." This painfully familiar division of consciousness into two figures, often preposterously different, is an incisive psychological operation that is found to have repercussions on the unconscious” (p. 94). Art therapy can create self-awareness of this
changeability of “identity” and can assist the client to bring his or her varying “identities” and the role they play into consciousness. This may in turn result in long-term changes in mental health. As previously discussed, as therapeutic interventions are repeatedly utilized, long term changes in thinking patterns and positive mental health can occur. With combat veterans, the opportunity to express and explore the “inner” experiences of war through making a mask can be cathartic and healing.

To clarify and continue the discussion of identity, the following example of the possible varying “identities” of a woman will be used. As a woman moves through life she can potentially identify herself as a daughter, wife, mother, teacher, student, expert, friend, professional, colleague, leader, athlete, artist, caretaker, employee, etc. The mother/wife can spend her time at home caring for her family, relating to the members of her family in differing ways as well as spend time in a “profession” or in identifying herself in another category of teacher, student, expert, friend, professional, colleague, leader, athlete, artist, caretaker, or employee, etc. Her relationships as mother/wife can also encompass various “identities” depending on interactions with her children that can be vastly different than her interactions and relationship with her husband/partner, even though she may be in the same vicinity of both her husband/partner and children. The woman can potentially perceive herself in differing “identity” roles when she is with her children and when she is with her husband even if the whole family is present. She can identify herself as “mother” identity and as “wife/partner” identity at the same time.

Problems can arise when conflicting “identities” exist and a person dissociates from one as if it does not exist. Another way to clarify this shift in roles is say that a person changes differing aspects of himself or herself depending on the elements of a given situation. Using the same example as above, the mother could experience a
situation that is life threatening to her family and she could possibly put on the “identity” or “mask” of fierce protector, warrior or heroine. In this instance she would move from embodying traits of nurturance and care giving, typical of the “mother” identity, to those traits needed in a situation such as aggression, strength and alertness needed to protect her family. Once the threatening situation has passed, the woman may be able to easily move back to "mother" to comfort and care for her children and family.

Most people experience events in life that require them to easily move from one “identity” between another, to put on a different “mask” depending on the situation. As mentioned previously, neurosis can arise when a person has difficulty taking off one “mask” and putting on another one when needed based on environmental factors. As discussed earlier in this literature review, if an individual experiences traumatic and intense events, aspects of these events can strongly influence the lens through which the individual perceives his or her surrounding environment. In other words, the person can be so heavily influenced by the trauma that each “mask” that he or she wears in subsequent different environments is colored with the “identity,” experiences, and memories associated with the traumatic event.

Due to this, multiple "identities" can become dissociated from each other and may not be integrated into a functioning whole. This is often what happens with combat veterans who suffer from PTSD. For example, when an individual is involved in the armed forces, he or she is potentially exposed to combat situations, and the “mask” or “identity” as soldier is accessed.

Depending on variables such as the frequency and intensity of situational experiences in combat, the person may be required to identify himself or herself as “soldier” or any variation such as, protector, hero, villain, killer, etc, for extended periods
of time. It is well known that a part of the beginning preparation for the armed forces is a basic training “boot camp” situation. It is also common knowledge that a central aspect of the basic training “boot camp” experience encompasses the breakdown of a person’s identification as an “autonomous individual” to that of a loyal “member” of a collective group, a combat team. This is a specific example of the concept discussed earlier of the malleability of identity.

In the process of transformation from autonomous individual to member of a combat team, the person is often asked to purposefully dissociate from his or her personal set of values, his or her “identity,” to a code of values that matches the group. The soldier is trained that his or her life and the lives of his or her combat troop may depend on how well he or she fulfills his or her role as “soldier” and requires that he or she wear the “mask” of soldier without question. For example, one such ethical principle that may be challenged is that of the value of human life. In civilian life before becoming a soldier, a person may unequivocally believe that taking the life of another human being is immoral, however, in a military combat environment, this ethical principle of the value of human life can become extremely altered, even reversed. This alteration of what was once an unequivocal value can in some cases cause significant dysfunction.

When a person who once believed that it would be unfathomable to kill another human being is faced with life threatening situations that requires killing for survival and/or to protect others in the combat team, the previous beliefs and values held by the individual are often no longer applicable. As the “soldier” identity is developed, the individual’s “civilian” identity is put aside as well as any corresponding beliefs or values that are necessary to be a successful “civilian.” This necessity for change in moral and ethical code can be detrimental to the “individual whole” or “persons style of life” or if it
is in conflict with a previous concept of self that believed killing another human being to be immoral and unfathomable.

In other words, the healthy perception of a whole psychological identity can split apart due to factors such as these described. The required change in the person’s moral code when identifying as “soldier” can result in significant impediments with re-assimilating into his or her prior “identity” as a civilian when armed forces service is complete. Even more detrimental if the soldier was required to repeatedly wear the identity/mask of “killer” while in combat to preserve his or her life or the life of others in his team. Since this “mask” and identity may be in direct opposition to his or her original set of values and moral ethics, the soldier then may not be able to successfully take off the “mask” of soldier and reinsert the “mask” of civilian.

The moral and ethical guidelines that were followed as a civilian before becoming a soldier no longer apply because they have been potentially confronted, become null and void, and reversed when in a combat situation. This internal conflict of past and present beliefs of morality and the very tangible reality of living with incongruent belief systems, experiences and behaviors can result in confusion and crisis of identity. The core identity and perception of self may become split into incongruent parts. This is often where the dissociation of identities so common in PTSD originates. The “individual whole” shatters and a schism is formed into separate dissociated and disintegrated realities and identities.

As the soldier returns home to civilian life, and tries to put on the “civilian” mask he or she wore before going into the armed services, the mask may not fit anymore, and furthermore it may not even exist in the warehouse of personal identities. The soldier who is reinserted into his or her former life is expected to have the ability to easily move between identities, to easily re-integrate with civilian identity and function normally in
daily life as if the soldier identity never existed. This expiration of the “soldier” identity makes the association with this identity, while in civilian life, uncomfortable and debilitating for the veteran.

Yet, few veterans who return from service have the psychological skills and means to “switch” identities easily and to effortlessly “retire” the expired “soldier” and go back to civilian life. This is often due to the intensity and length of experiences in combat situations and accompanying traumatic memories in which the person is trapped. When this happens, the veteran can experience deficiencies and problems with performing tasks related to normal daily functioning such as; driving to grocery store, going to the dentist and interacting with friends and family members. The veteran’s “individual whole” or psychological identity still has pieces or layers of the “soldier” adhered to the internal concept of self and can become easily “triggered” by external events to become “soldier,” when elements reminiscent of combat experiences occur. This triggering of the “soldier” identity, through flashbacks, while in a civilian setting is one of the defining aspects of symptoms related to PTSD and results in momentous dysfunction in the lives of the veteran as well as those he or she associates with in life.

The art therapy intervention of mask making can help with the exploration of issues of identity. The following section will discuss mask making as an effective art therapy directive.

Art Therapy Intervention - Mask Making as a Form of Expression

In art therapy, the use of mask making can be a powerful cathartic experience. Designing an art mask allows the client to project their emotions and perceptions into a tangible object that can be viewed as representative of his or her experiences. Art making accesses the subconscious mind and bypasses the critical, language based processing,
bypassing the “spin-doctor” language based explicit and consciously controlled aspects of self—identification (perception). Through the “safe” expression of subconscious feelings and memories during the mask-making directive the individual has a way to explore daunting and often times overwhelming feelings through a third “neutral” party, the artwork.

Masks have been used in individual and group therapy sessions to assist clients to explore their identity and to integrate disowned aspects of self. Mask making serves as an expression of an individual’s self-perception of his or her identity. It is a way for the individual to express and externalize emotions associated with an inner persona. Johnson (1987) believes, “instead of the discussion of a feeling, one has a discussion of a picture of a feeling, a less threatening situation for the patient because the picture is concrete and external to the self” (p. 11). In this way, the mask serves as an avenue, or conduit through which integration of all aspects of an individual can begin. When patterns of association in the mind are connected through new awareness and thinking, the individual’s awareness of self expands. For the soldier, the persona/identity can be expressed in a controlled way and troublesome implicit memories may be brought to the forefront of consciousness. As the soldier/veteran makes the mask, the representation of how he or she experienced war begins the healing process.

The person can begin to become aware of past experiences and make sense of the experiences. As he or she continues working with an art therapist, the opportunity arises to express, through the imagery, feelings that may have been overwhelming and debilitating to talk about. Talwar (2007) states, “during an art therapy session, it is not uncommon for a client to put into pictures a speechless terror that cannot be put into words” (p. 26). The speechless terror for a soldier may be the life threatening situations
that were experienced during combat. Through the art making the soldier/veteran can express feelings related to war experiences in a way that allows for a sense of control. Since the client is in control of how the mask is made, the depth of expression of feelings is also perceived to be in control by the client. During the art making session/s, the client has an empathetic other, the art therapist, present to witness the art making process. This “witnessing” can be a powerful aspect of the healing process, as the client is be validated by the art therapist.

**Mask Making Technique**

There are various ways of making masks for an art therapy intervention. One option is to use a plastic mask template and another is to create the mask directly from the artist. Both options include using Plaster of Paris of gauze strips to make the plaster mask that will then be decorated and embellished. The procedure for making a mask of the actual client’s face involves applying plaster gauze directly to the face. This second option requires that the person have their face covered in the plaster strips until somewhat dried and may not work for every client, as having the material on the face may be too intense of a sensory experience and may trigger PTSD symptoms. The art therapist should assess the appropriateness of this option before using it as a part of the intervention.

The following steps outline how to create the mask:

1. Cover and protect the client’s face with and oil based lotion, use petroleum jelly to cover and protect the eyelashes and any other facial hair, cover the ears and scalp hair with plastic wrap.
2. Apply multiple layers (at least 3) of Plaster of Paris gauze roll strips a few inches wide and tall by dipping in warm water and smoothing over face.
3. After approximately 20 minutes the mask will be ready to take off. Allow 24 hrs for mask to dry completely.

For the creation of a mask utilizing a plastic template the first preparation steps are skipped and the Plaster of Paris gauze strips are applied directly to the plastic template. After the mask is dry it can be painted it can also be embellished with cut our images from magazines and found objects such as feathers, stones, seashells, etc.

Through mask making the client can tell the story of their experiences in a tangible way. The art making allows the sublimation of emotion into an art object. Johnson (1987) illustrates this point and states, “the need to disown and deny the affects and memories of the trauma, and to remain in control of them, are more effectively accomplished when these images arise on paper, in a dance, or in playing music” (p. 11). The internal conflict of self and experiences can become tangible through the art object and then explored in a safe way. The metaphor of the mask becomes a symbolic representation of the schism between differing identities. With dissociation that is common in trauma, part of a person’s identity is often separated from the whole. One of the therapeutic advantages of art therapy is that it fosters a client’s perceived sense of control and embraces the client’s power of creation. As the client utilizes his or her creativity, self-esteem can also be improved.

**Art Therapy Intervention – “Time-Line/Life-Line” for Integration of Trauma**

Another art therapy intervention that can be useful is resolving trauma is the time-line or life-line directive. During this art therapy intervention, the client is directed to create a visual map and “memorial” of significant events and milestones in his or her life. The client is invited to create the map or time-line using any materials, however, a long sheet of paper and colored pencils or markers may be the most appropriate materials for
beginning. When creating his or her timeline, each person is asked to draw a line down the paper. The line can be depicted in any way, straight, curvy, as a road, or a river, etc. The client is then asked to illustrate or depict with symbols significant positive milestones or events beginning with early years that are remembered. Examples of these events can be things such as, birthdays, entering middle school, high school graduation, marriage, or birth of children if applicable. These events are illustrated on the top section of the timeline in chronological order. The client is also directed to illustrate or depict with symbols any negative events that occurred on the bottom half of timeline. Examples of negative events can be things such as the loss of a pet, death of a loved one, car accident or injury, or a noteworthy traumatic event. The client is asked to identify the approximate place on the timeline where these negative or traumatic experiences occurred.

As the client is working, the art therapist assists the client to identify events and to place the events on his or her time-line. Once the overall time-line is complete, the art therapist will instruct the client to review the time-line to see if any significant events were omitted or if the time-line is complete. If the trauma experiences are not present on the time-line, the art therapist can verbally ask the client if there are any details that he or she can remember related to an approximate time the events occurred. In the case of working with a combat veteran, the client can describe which did the trauma occurred in and the approximate place on his or her time-line.

The second part of the art therapy intervention directs the client to pick one or a couple of events that were more formative, more significant, or more traumatic than others. The art therapist informs the client to choose events that he or she would like to give homage to or to honor. As the client is working through which events to pick, the
art therapist can guide the process by asking open-ended questions and assisting the client to identify a significant traumatic event that he or she would like to explore. After the significant event or events are selected, the client is instructed to begin the process of creating symbolic memorials to the events. Some options may be to create a separate art image, such as a painting expression or collage with cut out images from magazines. The client could also use clay to create a two-dimensional representation of the event, such as the building or place that the trauma occurred in.

During the creation of the memorial, the client is directed to think about how the event shaped who they are presently, both positively and negatively. After the completion of the additional memorial artwork, the client is asked to reflect upon how the expression of the event is symbolic of the impact the event had on his or her life. In memorializing the event through art materials, the client is able to not only express the significance of the event, but to also place the event in the chronology of his or her life. Through the processing of the artwork with the art therapist, the client can begin to piece together how the trauma informed his or her behavior after the event took place. Through the exploration of the traumatic events through the time-line artwork profound insight and opportunities for healing can occur.

Methodology

The research presented in this discussion was reviewed to gain an understanding of the effectiveness of art therapy as a healing modality in the treatment of PTSD. This inquiry leads insight into how creativity engagement in a therapeutic environment such as in art therapy leads to neuroplasticity and resulting changes in behavior. The research done for this Master’s project pertained to the effects of trauma on the brain and how art therapy can be an effective healing modality for individuals with PTSD. Peer-reviewed
research articles and books were considered and utilized. Consideration was given to research indicating the effectiveness of art therapy with individuals who experience PTSD. Peer-reviewed research articles and books were examined regarding the neurophysiology of the brain and how psychotherapy interventions can lead to changes in the brain.

Several case studies are utilized to illustrate the debilitating effects of PTSD. Over seventy-five peer-reviewed scholarly articles were selected from selected journals such as: Art Therapy: Journal of the American Art Therapy Association, The Arts in Psychotherapy, Journal of Anxiety Disorders, Brain Behavior and Immunity, Journal of Clinical and Experimental Neuropsychology, Neuropsychological Rehabilitation: An International Journal, Psychological Trauma, Theory, Research, Practice and Policy, Medical Hypothesis, Psychological Bulletin, Physiology & Behavior, Journal of Traumatic Stress. Also reviewed were books written by experts in the fields of neuroscience, psychology and art therapy. Additionally, web-based information was retrieved from online reference sites as the Merriam-Webster Dictionary, The Society for Neuroscience, The Freelance Star on-line news magazine, The United States Department of Defense National Center for PTSD, The Art Therapy Blog, and US News and World Report On-line.

Final Summary and Conclusion

In the following final summary the unique contribution of art therapy in the treatment of PTSD will be concluded. The discussion will focus on the arguments outlined in the following three major areas: (1) the expression and externalization of traumatic memories, emotions and fears related to trauma, (2) the process of symbolization and meaning making of trauma experiences, and (3) the establishment of
new thought patterns related to resiliency and strength through the reframing and integration of the trauma experiences into healthy self-perception.

Art making in a therapeutic environment is also not only a form of expression but is also an effective method to encourage alternative ways of seeing a problem. Art therapy has the potential to instill profound change and healing from mental illnesses, such as PTSD. From what is known regarding perception, all experiences are perceived through the lens of the person experiencing them. In that way, what is experienced is relative to past experiences and also to present conscious awareness. The experience of art making in a therapeutic environment can change a person’s perception of who they are in multifaceted ways.

It could be argued that art making in a therapeutic environment is unmatched in its striking ability to allow the expression of personal experience and perception. Adler believed that each person has a unique way they see the world and move through life. He termed this movement, “teleology,” the striving to meet a specialized goal (Adler, 1936, as cited by Ansbacher and Ansbacher (1956). Adler theorized that since each individual is striving towards an end goal, he or she compensates for areas that are perceived as weaknesses. In art therapy, perceived weaknesses can be explored and transformed into strengths. Through the fostering of meaning making of trauma, good mental health can be achieved. Adler as cited by Ansbacher and Ansbacher (1956) states,

The science of individual psychology developed out of the effort to understand that mysterious creative power of life which expresses itself in the desire to develop, to strive, to achieve, and even to compensate for defeats in one direction by striving for success in another. This power is teleological, it expresses itself in the striving after a goal, and, in the striving, every bodily and psychological
movement is made to cooperate. It is thus absurd to study bodily movements and mental conditions abstractly without relation to an individual whole. (p. 92)

Adler theorized that the expression of a persons’ style of life is unique to each person. In describing the gift of being a poet, or a careful observer of life, Adler as cited in Ansbacher and Ansbacher (1956) discusses “until recent times it was chiefly the poets who best succeeded in getting the clue to a persons style of life. Their ability to show the individual living, acting, and dying as an individual whole in closest connection with the rest of his environment rouses our highest admiration” (p. 329). Adler believed that a holistic approach to treatment with clients was most necessary to accomplish therapeutic outcomes. Art therapists can also successfully formulate a “clue to a persons style of life” and then engage the individual whole while facilitating the re-connection of differing aspects of self to each other as well as to the rest of the environment.

One of the superlative aspects of art therapy is that during therapeutic sessions, the client is called to step into the space of the numinous, of the soul, and express deep emotions seated at the core of his or her persona. Art therapy is a unique approach that allows a person to express deep emotions and explore subconscious beliefs in a safe environment. Levine (2009) argues that even though the definition of “civilization” began with literacy, expression through art is, and has, for the most part always been largely available to all and is hence an innate, powerful and visceral form of communication. Because visual expression is accessible to almost everyone (if given the opportunity) it is often effective at clearly communicating emotions and perceptions that may not be easily communicated by verbal language.

Art making allows for the expression of traumatic memories and emotions in significant ways. One of which is its capacity to focus on and uncover the powerful and
potentially unconscious patterns of thoughts and behaviors at the deepest levels of psyche
or in other words, the “soul.” Levine (2009) supports this and discusses that art belongs
in the realm of the “sacred,” because it is separate from daily functional actions. Levine
(2009) confirms the notion that arts-based therapies are unique in their ability to promote
the potential for change through the promotion of new ways of seeing a problem and
states,

The expressive arts therapist could then be considered as an expert in moving
from the center to the margin and returning home again, from the literal reality of
the world to its imaginal possibilities and back again in order to find a new
perspective. This capacity to cross over is grounded in the arts-based orientation
of expressive arts, for the artist is always moving back and forth between the real
and the possible. (p. 37)

In Levine’s (2009) theory of trauma resolution, he emphasizes the importance of
recognizing the individual way that each person might experience traumatic events and
the significance of the personal expression of emotions related to those traumatic events.
Levine (2009) argues that even though many people may encounter the same trauma,
each person will have a particular way that they respond to their experience of the
trauma. Furthermore, Levine (2009) believes that an important aspect of the resolution
and healing from trauma is to understand that the victim of trauma is capable of making
meaning of the trauma. Levine (2009) believes that art-based therapy is a distinct
approach in the treatment of trauma due to this capacity.

Art therapy not only allows clients to explore how their unique reality or memory
of trauma fits with other aspects of their consciousness, but also allows for a beneficial
means to express it. Art making can be both an enjoyable life enhancing activity, and an
extremely potent form of therapy. This is the core of the distinct approach that art therapy offers. Art therapy is a pleasurable healing process and offers compelling and effective results.

Art therapy is distinctive in the special way it encourages the client to explore his or her memory of a traumatic event and then to integrate such an experience into an understanding of the greater whole of who the client is at a core level. Art therapy allows the client to recover and heal by fostering the opportunity to find new meaning in experiences of traumatic events instead of simply re-experiencing never-ending flashback occurrences of the same memory. However, it is not only the expression of inner beliefs and perceptions but also the validation and witnessing by a trained professional that heals. In art therapy, an individual can, not only express the unique experiences of his or her journey, but also have validation of these experiences from the empathetic relationship with the art therapist. It could even potentially be the first time the client has had the opportunity to fully express how he or she experienced trauma and the resulting self-perception.

Many art therapists have witnessed the powerfully transformative capacity for “making sense” of and recovering from traumatic experience through art making. When given a chance to express his or her unique experience with trauma through artistic imagery, the client becomes empowered to begin the process of meaning making. Levine (2009) believes that “the goal of therapeutic practice is not to normalize clients but to restore to them the sense-making capacity that is intrinsic to their lives” (p. 44). Art therapy is exceptional as an avenue for connecting one of a kind artistic expression to meaning making.

The healing power of art therapy is positively correlated with changes in the
brain, which subsequently can improve the functioning level of the client in all aspects of his or her life. Art therapy is a healing modality precisely because it not only engages an individual’s mental, physical, and emotional processes; it also connects with a person’s spirit, their soul, in the most natural and profound ways. This engagement and “conversation” with the client’s soul is the place where true shift towards healing and integration can occur. In the treatment of trauma, the individual’s potential for recovery is largely due to the integration of previously fragmented memories, and disempowered, misguided limiting beliefs of self.

In trauma, the “body memory” of the somatic experience often becomes separated from the intellectual understanding and ability to “frame” the experience to fit into the “story” of other past experiences. Furthermore, this splitting and dissociation of body and mind cause pungent and real distress to the individual on a soul level. The individual has the dreadful experience of the fragmentation of the parts of self. This experience of separation causes a foreign and pervasive feeling of dis-ease. As the dissociated and disconnected self-perceptions continue to exist without reference to the whole united and healthy self, psychological dis-ease persists and can even result in the manifestation of a barrage of physical diseases that result from such underlying distress. When an individual begins the process of creating imagery in art therapy, he or she has an opportunity to express what it is like to experience the fragmented parts of self and the resulting emotional distress.

Within the context of the therapeutic relationship, integration of a client’s experiences, whether positive, negative or neutral into a reframed “story” can be tremendously helpful. In essence, as the client progresses through the therapeutic stages, he or she has an opportunity to become a champion of his or her life. The reframing of
client’s association with “victim” or “failure” to an unconditionally loving and integrated acceptance of all aspects of self is the key to healing from dis-ease and moving towards optimal health and wellness. It is necessary and critical to address issues and dysfunction holistically.

Embracing creativity in art therapy as the catalyst for the change and modification of unhealthy and dysfunctional behaviors, engages the mind, body and soul of a client. This holistic approach provided through art making has the potential to help and heal an individual from debilitating psychiatric symptoms. Art therapy involves healing the holistic aspects of a person including: a) the mind/brain through neural networks, thought processes, and perceptions, and behaviors; b) the body, through physiological response to experiences and behaviors; c) the soul which encompasses the essence of the individual’s spirit, psyche and heart. Creativity engagement in a therapeutic environment brings together all of these holistic aspects of an individual in an exceptional way. Art therapy is a practical approach to healing that intrinsically engages an individual’s spirit through the act of making imagery from the heart and soul.
References


Appendix

Unmasking the Agony: Combat Troops Turn to Art Therapy

The following masks were created in art therapy sessions at the Department of Defense’s National Intrepid Center of Excellence (NICOE).

Figure 3. I have destroyed my life and myself so that others may live. [Photograph of a Soldier’s Mask]. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask was created by an Army flight medic who said one side represents the United States shedding tears for the military and the other side represents the military shedding tears for the U.S.”
Figure 4. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask depicts the words TBI (traumatic brain injury) and PTSD (post-traumatic stress disorder) painted onto a vice clamped to the mask. The mask was created by a soldier symbolizing the pain he feels as a result of his traumatic brain injury.”
Figure 5. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask represents the men who were killed in action while the Marine who created it was in command. It symbolizes death and his attempt to resuscitate the wounded. His fingerprints on the nose and chin are reminders of his CRR efforts.”
Figure 6. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “Various memories and scenes from deployments are recreated on this Marine's mask. A drawing of his family on the mask's chin symbolizes how he felt they "took the brunt" of his issues after he returned home.”
Figure 7. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask symbolizes the soldier's need to camouflage himself to fit into society. The soldier shared that art therapy was one of the only times he felt he could truly express himself.”
Figure 8. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask symbolizes the patient's inability to open up about his emotions and experiences due to the stigma associated with mental health issues. He said the metal eyes represent how he feels service members are trained to be machine-like, or robotic. The background colors are those of Afghanistan's flag.”
Figure 9. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask was created by a Marine to symbolize his "split sense of self": his happy, civilian side, and an injured, military side that has been affected by war and traumatic experiences.”
Figure 10. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask was created by a soldier who was exposed to multiple blast injuries in combat. The mask depicts the EOD (explosive ordnance disposal) symbol. EOD units dispose of bombs or improvised explosive devices which could severely injury or kill if detonated.”
Figure 12. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask is part of a two-piece artwork exploring the significance of death and the surviving spirit that remains after a person is killed.”
Figure 13. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “This mask was created by a Marine and symbolizes a tough "outer warrior," although inside, soldiers may be dealing with difficult emotions.”
Figure 14. Photograph of a Soldier’s Mask. Courtesy of National Intrepid Center of Excellence. Retrieved from http://usnews.nbcnews.com/post-traumatic-stress-disorder. “One soldier created this mask to depict his injuries and his inability to open up about his feelings and experiences. The patient included three stitches to symbolize that he felt he was beginning to heal at the NICOE.”