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Somatic Experiencing and Expressive Arts Therapy to Support Autonomic Regulation in Trauma Treatment with Adults: A Literature Review

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Abstract

Autonomic nervous system dysregulation is commonly experienced in adults who have experienced trauma and underlies several symptoms of post-traumatic stress disorder (PTSD). Though established treatments for PTSD have a strong evidence base, they can increase dysregulation during treatment, leading to high drop-out rates. Somatic experiencing (SE) and expressive arts therapy (ExAT) are two emerging methods that support autonomic regulation in trauma treatment. This literature review provides an overview of the use of SE and ExAT in trauma treatment with adults and describes concepts and techniques from SE and ExAT that are used to support regulation during treatment. Several shared concepts emerged when reviewing the techniques used in these methods, including the window of tolerance/resilient zone; titration and pendulation; the use of social engagement; the use of positive interoceptive, sensory, and kinesthetic experiences; and utilizing resources. This literature review provides recommendations for how SE and ExAT could be integrated to support regulation in trauma treatment with adults, including through the creation of a combined SE/ExAT treatment model.

Somatic Experiencing and Expressive Arts Therapy to Support Autonomic Regulation in Trauma Treatment with Adults: A Literature Review

My aim in this literature review is to explore the ways that somatic experiencing (SE) and expressive arts therapy (ExAT) can be used to support autonomic regulation in trauma treatment with adults. Trauma, which the Substance Abuse and Mental Health Services Administration (SAMHSA) (2014) describes as resulting from events or circumstances that are "experienced as physically or emotionally harmful or life threatening" (p. 7), can have a significant impact on an individual's physical, emotional, and mental well-being. Individuals who are impacted by trauma often experience alterations in arousal, as well as disruption in the functioning of the autonomic nervous system, which helps to regulate arousal. This can manifest both as chronic hyperarousal, hypervigilance, sleep disturbance, and emotional flooding as well as chronic hypoarousal, dissociation, numbing, and withdrawal. Autonomic dysregulation can be triggered by stimuli associated with the traumatic event, frequently leading survivors to avoid associated internal and external reminders (American Psychological Association [APA], 2013; SAMHSA, 2014).

While established treatments for post-traumatic stress disorder (PTSD), such as prolonged exposure (PE) and other trauma-focused cognitive behavioral therapy (CBT) treatment methods have a strong evidence base, they do not directly address autonomic dysregulation as part of trauma treatment. These treatments instead focus on exposure to and processing of traumatic memory, which often leads to increased activation during treatment. While these treatments can be effective for some survivors, they have high non-response rates, with one patient losing their PTSD diagnosis for every two to four patients treated. In addition, they have high dropout rates (around 18%), due to clients' difficulty tolerating exposure to trauma memories and the associated autonomic dysregulation (Anderson et al., 2017; Baker et

al., 2018). Because of this, there is a need for continued development and evaluation of other trauma treatment methods, particularly those that support autonomic regulation during treatment.

In this literature review, I will discuss two treatment modalities, SE and ExAT, that have been used for trauma treatment with adults and that integrate tools to support autonomic regulation. SE is a body-based therapy developed by Levine (2010) that has the goal of restoring optimal functioning to the autonomic nervous system after disruption due to trauma. ExAT is one of several creative art therapies (i.e., music therapy, art therapy, drama therapy, dance/movement therapy) and is focused on the integration of various art modalities in therapy. Though ExAT has been applied with numerous populations, it is used in trauma treatment in part due to its capacity to access non-verbal traumatic memory (Malchiodi, 2020). Both these methods incorporate several concepts and techniques that can be used to support regulation during trauma treatment.

My interest in this topic stems from my background working in the domestic violence field, my interest in working with communities that have high rates of trauma (such as LGBTQ communities), and my personal experience processing and healing my own trauma through ExAT. As I began my graduate program in clinical mental health counseling and ExAT, I noticed that many of the expressive arts interventions I explored in class had the potential to tap into traumatic memory through sensory and kinesthetic experiences. I also found myself searching for methods to support my own autonomic regulation as I would often feel dysregulated when traumatic material would surface in these interventions.

At the same time, I had several experiences that helped me see the benefit of somatic-focused methods in supporting autonomic regulation. I went to an introductory workshop on SE and experienced first-hand SE strategies that help facilitate regulation. In addition, at a

conference on psychodrama, I participated in an experiential led by a practitioner with somatic trauma training who was able to track my nervous system activation and effectively support me in maintaining regulation. These experiences made me interested in learning more about SE and how it could be used to support regulation.

During this time, I was also researching ExAT in trauma treatment and dedicated several class projects and papers to this topic. I learned more about the theory behind the use of ExAT in trauma treatment, including how it could facilitate regulation. However, though I found models for using ExAT for trauma treatment with children and adolescents (Richardson, 2016), no models had been developed on ExAT for trauma treatment with adults. Though Malchiodi (2020) recently published an excellent book on ExAT trauma treatment for children and adults, it is more of an overview and thematic exploration, rather than a step-by-step guide. I saw the need for the development of models that focus on ExAT in trauma treatment for adults and for these models to integrate strategies that support autonomic regulation.

This literature review brings together my interest in using SE and ExAT for trauma treatment. In addition to reviewing literature on SE and ExAT, I highlight specific concepts and techniques that support autonomic regulation in each method. In my discussion, I explore shared concepts and themes that emerged through the review of the literature and provide recommendations for future research and clinical application. This literature review lays a foundation for the development of future treatment models through providing recommendations for how SE and ExAT could be combined to create an integrated SE/ExAT treatment model for trauma treatment with adults.

Literature Review

In the following sections, I review literature on trauma, trauma treatment, SE, and ExAT as they relate to autonomic regulation in trauma treatment. I begin by defining trauma and describing its impacts, including its impact on autonomic regulation. Then I describe current approaches to trauma treatment, highlighting the need for continued development and evaluation of trauma treatment methods. Next, I focus on SE and ExAT, describing their history, the theory behind their use in trauma treatment, research on their effectiveness, and specific concepts and techniques they use to support autonomic regulation. Finally, I describe literature that exists on the integration of SE and ExAT.

Trauma

Though written references to the psychological impacts of war and other potentially traumatic events can be seen throughout most of written history, psychological trauma as a concept within western mental health literature began to develop in the 19th and 20th centuries (Figley et al., 2017) and was more formally recognized in 1980 with the introduction of PTSD into the DSM-III (Eagle & Kaminer, 2015). After the 1980s, the field of traumatic stress studies grew significantly, with national and international organizations supporting research and the development of assessments and treatments for trauma (Figley et al., 2017).

Throughout this development, there was considerable debate about the definition of trauma (Eagle & Kaminer, 2015). Though much of the research on trauma and trauma treatment has been based on the DSM's criteria for PTSD (2015), individuals' experiences with traumatic events are far more varied, with only a small percentage going on to develop PTSD (SAMHSA, 2014). There has been an increasing recognition of this complexity, as reflected in the recent introduction of complex PTSD as a distinct diagnosis from PTSD in the ICD-11 in 2018 (Cloitre et. al, 2019).

In this paper, I focus on trauma treatment with adults, which includes treating trauma experienced during adulthood as well as the impact of childhood and developmental trauma. I will use SAMHSA's (2014) definition of trauma, which states that:

> Trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual's functioning and mental, physical, emotional, or spiritual well-being. (p. 7)

This definition was created through an extensive review of current trauma definitions and collaboration between trauma researchers, practitioners, policymakers, and survivors. It focuses on three elements of trauma: a potentially traumatic event, an individual's subjective experience of that event, and the impact of that event on the individual (SAMHSA, 2014).

Numerous events and circumstances can lead to trauma, including experiencing a natural disaster, car accident, or sudden physical injury. Traumatic experiences can be interpersonal in nature, such as being physically or sexually assaulted, being abused or neglected as a child, being involved in combat or war, or experiencing an abusive relationship. Finally, individuals can also be involved in traumatic experiences indirectly, such as through witnessing someone being assaulted or seriously injured or learning about the sudden death of a loved one (SAMHSA, 2014). Exposure to these potentially traumatic events is relatively common. In fact, the National Comorbidity Study found that about 60% of men and 51% of women reported they had experienced at least one traumatic event during their lifetime (Kessler, 2000).

Exposure to traumatic events can have a number of impacts on individuals that range in both duration and in severity. Though most people experience traumatic or potentially traumatic events at some point during their lifetime, not all develop PTSD or other long-lasting negative

impacts from trauma. Some may develop symptoms that do not fully meet the diagnostic criteria for PTSD while others may experience resilient responses or have brief disruption to their baseline functioning (SAMHSA, 2014). Finally, there is increasing attention being paid in the literature to post-traumatic growth, reflecting that some individuals experience positive and adaptive reactions to traumatic experiences, supporting them in being more resilient in the future (Figley et al., 2017).

Individuals may experience several physical, emotional, cognitive, and behavioral reactions to traumatic experiences. Physiologically, traumatic experiences can set off a “cascade of biological changes and stress responses" (SAMHSA, 2014, p. 65) that can impact an individual's cognitive, emotional, and somatic experience. Exposure to traumatic experiences involves activation of the autonomic nervous system, which orchestrates responses to threats and danger through preparing one to physically to fight or flee, as well as the parasympathetic nervous system, which deescalates these responses (Fisher, 2019). After traumatic events, individuals may experience alterations in arousal and reactivity, as seen in criteria e for PTSD in the DSM V (APA, 2013) with increased “autonomic nervous system responsiveness to daily life stress and especially to any subtle or obvious reminder of the traumatic events” (Fisher, 2019, p. 157). In some individuals this can lead to either chronic hypervigilance and arousal or under-arousal and numbing as well as sleep disturbance. Along with these biological changes, other physical impacts of trauma can include effects on the immune system, appetite and digestive system, and increased risk for chronic health conditions (SAMHSA, 2014).

In addition, trauma can lead to several cognitive and emotional impacts. Due to sympathetic nervous system activation during traumatic experiences, the encoding of traumatic memory is often altered. We have two types of memory, explicit memory, which involves a

time-based narrative component and helps us make sense of our feelings and experiences, and implicit memory, which is unconscious and is composed of sensations and images. Traumatic memory is often stored only as implicit memory without a corresponding narrative component. When this memory is activated through sensory or other reminders of the trauma, it is experienced as if it were happening in the present moment, leading to nervous system activation as well as psychological distress (Richardson, 2016). In addition to physiological reactions and psychological distress in response to "internal or external cues that symbolize or resemble an aspect of the trauma" (APA, 2013, p. 271), various other intrusive symptoms, such as intrusive memories, dreams, and flashbacks, are often experienced by trauma survivors and are included in the DSM V criteria b for PTSD (APA, 2013).

Additional cognitive and emotional impacts of trauma can include intense experiences of emotions such as anger, fear, sadness, and shame, as well as changes in an individual's beliefs about the world and themselves. Individuals may feel overwhelmed or flooded by emotions or numb and cut off from them (SAMHSA, 2014). They may have dissociative symptoms, including feeling detached from themselves or their body, or feeling like their surroundings are unreal (APA, 2013). In addition, survivors may have difficulty with emotion regulation, particularly if they have experienced complex or developmental trauma (SAMHSA, 2014). Finally, traumatic experiences can challenge or change individuals' beliefs about safety, including thoughts about themselves, others, their environment, and the future, as is often seen with complex or interpersonal trauma (SAMHSA, 2014).

These physiological, cognitive, and emotional experiences can have a significant impact on survivors' behaviors. Given the physiological and psychological distress that can accompany stimuli associated with the traumatic experience, many individuals may avoid or attempt to avoid

internal and external reminders of the trauma, criteria c for PTSD in the DSM V (APA, 2013). Though many survivors use healthy coping strategies to manage their arousal and emotional experience after trauma, some individuals may also engage in compulsive, impulsive, or self-injurious behaviors to self-regulate or regain a sense of control. In addition, substance abuse is correlated with trauma experiences, and some individuals may use substances as a form of self-medication to manage or avoid difficult emotions after traumatic experiences (SAMHSA, 2014).

Finally, individuals who experience complex trauma due to exposure to prolonged interpersonal trauma, especially during childhood, often experience several long-lasting effects beyond those that are common with single incident traumas in adulthood. For example, the ICD-11 diagnostic criteria for complex PTSD involves meeting both the criteria for PTSD as well as severe and persistent problems in affect regulation, negative beliefs about oneself, and difficulties sustaining relationships (World Health Organization, 2019).

Trauma and Autonomic Dysregulation

The autonomic nervous system, which includes both the sympathetic and parasympathetic nervous system, plays a key role in preparing our body to respond to instances of stress and threat, as well as in returning to baseline activation after a threat has passed (Ziegler, 2012). After traumatic events, many individuals experience symptoms of either increased activation (i.e., hyperarousal, irritability, insomnia, or anger) or deactivation (i.e., numbing, withdrawal, dissociation, avoidance). Though for many individuals these changes resolve relatively quickly, some individuals, including those with PTSD, exhibit chronic changes in autonomic nervous system responses after traumatic experiences (Sherin & Nemeroff, 2011).

This dysregulation can manifest as challenges with affect regulation, as an individual's nervous system struggles to “recover from heightened states of emotion or from states of

depression and numbing" (Fisher, 2019, p. 157). Chronic challenges with affect regulation are particularly common for individuals who have experienced complex or developmental trauma, particularly during early childhood, as the autonomic nervous system and affect-regulating structures in the brain are developing during this time (Fisher, 2019).

Trauma Treatment

Most of the current research and evidence base for trauma treatment with adults focuses on the treatment of PTSD and has emerged from studies of CBT (Eagle & Kaminer, 2015). Both eye movement desensitization and reprocessing (EMDR) as well as several trauma-focused CBT treatments, including prolonged exposure (PE), CBT with a trauma focus, and cognitive processing therapy, are currently recommended as psychological treatments for PTSD by the International Society for Traumatic Stress Studies (ISTSS) (2019), based on its review of randomized controlled trials on PTSD treatment.

Though there are differences in the emphasis and techniques used across various trauma-focused CBT interventions, these interventions all involve psychoeducation about trauma and its impacts, some degree of exposure to traumatic memories, and cognitive reprocessing of traumatic memories to modify maladaptive trauma-related beliefs (Eagle & Kaminer, 2017). In addition to these elements, PE also involves in-vivo exposure to trauma-related triggers. Another evidence-based method, EMDR, integrates elements of CBT along with bilateral physical stimulation (Eagle & Kaminer, 2017). In this method, bilateral tones, tapping, or eye movements are used while the client focuses on targeted traumatic memories in order to stimulate information processing and integrate these memories (ISTSS, 2019).

While established treatments for PTSD have a strong evidence base, there are some limitations to their use, leading to the need for continued development and evaluation of other

trauma treatments. For example, established PTSD treatments have high drop-out rates (around 18%) and nonresponse rates, with an average of one patient losing their diagnosis for every two to four patients treated. These drop-out rates are due to some clients' difficulty tolerating exposure to trauma memories and the associated autonomic dysregulation (Anderson et al., 2017; Baker et al., 2018). In addition, many clinicians do not use certain trauma-focused treatments, such as PE, even if they have been trained in them, due to concern that they may re-traumatize clients. Finally, for some clients, traumatic memory is stored non-verbally, leading to difficulties in verbal recall and poor response to trauma-focused talk therapy (Baker et al., 2018).

In addition, while there are a number of evidence-based treatment options for PTSD, the evidence base for treating complex traumatic stress is still emerging, with more focus in recent years (Eagle & Kaminer, 2015). Some studies have shown that PE and CPT both reduce symptoms of C-PTSD but that substantial symptoms remain after treatment (Kaminer & Eagle, 2017). Treatment literature, such as the *ISTSS Expert Consensus Treatment Guidelines for Complex PTSD in Adults*, recommends phase-based treatment that is guided by "a hierarchy of treatment needs assessed prior to treatment" (Cloitre et al., 2012, p. 7), and which includes an initial phase focused on stabilization and skill-building, including skills for emotion regulation (Kaminer & Eagle, 2017).

Trauma Treatment and Autonomic Dysregulation

Starting in the late 20th century, several scholars and clinicians such as Levine (2010), Ogden et al. (2006), Porges (2011), and van der Kolk (1994, 2014) began writing about the somatic nature of trauma, utilizing neuroscience research to highlight the effect of trauma on the body. These scholars and clinicians argued that trauma treatment must address trauma's impact on the body and the autonomic nervous system. Several somatically oriented therapeutic models

for trauma treatment have since been developed, including SE (Levine, 2010; Levine & Frederick, 1997), sensorimotor psychotherapy (Ogden et al., 2006), somatic trauma therapy (Rothschild, 2000), the neuroaffective relational model (Heller & LaPierre, 2012) and the trauma resiliency model (Grabbe & Miller-Karas, 2018). These body-based therapies involve a focus on the client's experiences of internal bodily sensations, also known as interception. They work to address autonomic nervous system dysregulation with a "bottom-up" (Grabbe & Miller-Karas, 2018, p. 76) approach, beginning with addressing the somatic experience of the body before addressing cognitive responses to trauma.

Expressive arts therapists who focus on trauma treatment such as Malchiodi (2020) and Richardson (2016) have drawn on this literature, highlighting ExAT's sensory and kinesthetic elements as key to its effectiveness in supporting regulation in trauma treatment. In the following sections, I will describe one of these somatic therapies, SE, as well as ExAT, and the techniques they utilize to support autonomic regulation in trauma treatment.

Somatic Experiencing

Somatic experiencing (SE) is a body-based therapy developed by Levine (2010) over the past 50 years that focuses on addressing the impacts of chronic and/or traumatic stress and restoring healthy functioning (Brom et al., 2017; Payne et al., 2015). Levine (2010) began developing SE in the 1970s, drawing from his multidisciplinary studies in stress physiology, medical biophysics, psychology, ethology, and neuroscience as well as his clinical experience. Though little has been written on the influence of other body psychotherapies on SE, Levine acknowledges the influence of William Reich, an early contributor to body psychology who utilized body work to release "muscular armour" (Young, 2008, p. 8) (i.e., energies held in the body as a result of trauma) (Levine, 2010; Levine & Frederick, 1997). In addition, Levine draws

on Gendlin's (1996) concept of the "felt sense" (p. 57) from focusing, a psychotherapeutic method that supports the development of client's inward bodily awareness. Finally, Levine (2010) heavily draws on Porges (2011) and van der Kolk (2014), influential theorists in stress physiology who utilize neuroscience to demonstrate the impacts of trauma on the body and who argue for the importance of integrating the body in trauma treatment.

In SE, trauma is defined as any event that causes long-term dysregulation in the autonomic and associated nervous systems. The goal of SE is to restore optimal functionality to these systems (Payne et al., 2015). SE focuses on restoring this optimal nervous system functioning through directing attention to internal interoceptive and musculoskeletal sensations (Payne et al., 2015). Rather than verbal processing of or extensive exposure to traumatic memories, SE involves gradual engagement with traumatic memory with focus on its physical and sensory (interoceptive, proprioceptive, and kinesthetic) aspects (Levine, 2010; Payne et al., 2015).

Early phases of SE focus on supporting clients in learning how to monitor their own arousal and return to a manageable level of arousal through attention to pleasant and unpleasant sensations in the body as well as other self-regulatory strategies, such as engaging with positive memories (Anderson et al. 2020; Brom et al., 2017). This focus on pleasant sensations in the body and the ability to move between pleasant and unpleasant sensations supports the development of corrective sensory experiences, which contradict the helplessness and overwhelm that can be associated with activation of traumatic memory (Payne et al., 2015).

Another primary goal of SE is to discharge the traumatic activation theorized to be stored in the body when defensive reactions to traumatic events are thwarted. Levine (2010) has argued that post-traumatic symptoms develop when individuals enter freeze or immobility responses

after their bodies have been activated in preparation for fight or flight and when this activation energy is not allowed to discharge. According to Levine (2010), these unfinished defensive and self-protective reactions are stored in the implicit memory of the sensorimotor system along with the associated bodily sensations as well as the fear and helplessness experienced at the time of the trauma. SE therefore focuses on supporting clients in increasing their tolerance of staying present with these challenging emotions and body sensations, allowing for the discharge of traumatic activation and the completion of incomplete defensive and self-protective responses (Brom et al., 2017; Levine, 2010).

In "Somatic Experiencing: Using Interoception and Proprioception as Core Elements of Trauma Therapy," Payne et al. (2015) laid out a neurophysiological rationale for the potential mechanisms behind SE in resolving dysregulation in the autonomic and related nervous systems resulting from trauma. They suggested that SE restores optimal functioning in the "core response network" (Payne et al., 2015, p. 2), which consists of the autonomic nervous system, limbic system, emotional motor system, and reticular arousal systems. These systems respond quickly and automatically to threatening stimuli and can become stuck in dysfunctional states in response to traumatic exposure, leading to extreme or erratic autonomic nervous system activation. According to the theory behind SE, these dysfunctional states are triggered specifically in situations where the nervous system's capacity to respond is overwhelmed or its response and ability to reset is blocked or prevented. Payne et al. (2015) postulated that SE can restore optimal functioning to the core response network through engaging the interoceptive and premotor cortices, areas of the brain that have direct connections with the core response network and which are activated through interoceptive, proprioceptive, and kinesthetic awareness.

Though frequently used in a multi-session format, SE has also been adapted to be used as a brief early intervention focused on stabilization and prevention of long-term PTSD symptoms in emergency and disaster situations (Leitch et al., 2009). Developed by Miller-Karas, Everett, and Leitch, the trauma resiliency model (TRM) draws on SE theory and techniques. TRM was initially used as psychological first-aid in disaster contexts but has been further elaborated as a psychotherapeutic model for use with trauma survivors, including those with complex trauma (Grabbe & Miller-Karas, 2018; Miller-Karas, 2015). Due to the overlap and similarities between SE and TRM, I draw from the research and literature on both in this literature review.

Research on Somatic Experiencing and Trauma Treatment

Though there have been few studies on the effectiveness of SE on treating trauma and PTSD, there is a small body of evidence supporting its use, leading it to be listed as an intervention with emerging evidence in the ISTSS's (2019) recommendations for PTSD treatment. Although several robust case studies exist on the use of SE and PTSD (Heller & Heller, 2004; Levit, 2018) at present, there are only a few statistically significant studies.

Several studies have evaluated the use of one to two session SE/TRM treatment with survivors of natural disasters. Leitch (2007) describes an exploratory study with 53 survivors of the 2004 tsunami in Thailand who received one to two sessions of SE. Data was collected through a symptom tracking form developed by the researchers. Though this study was limited by lack of a control group, convenience sample, and small sample size at follow-up, 67% of participants reported complete or partial improvement in symptoms after treatment. Only 22 participants were assessed at a one-year follow-up, but 90% reported complete or partial improvement in symptoms. Parker et al. (2008) provided single 75-minute SE interventions with 204 survivors of the 2004 tsunami in India, with 150 completing follow up assessments four and

eight months later. Though limited by the lack of a control group, they found that 90% of participants reported significant improvement of intrusion, arousal, and avoidance symptoms based on their responses to items taken from the Impact of Events Scale Revised Abbreviated.

Finally, Leitch et al. (2009) examined whether one to two sessions of TRM/SE reduced post-disaster symptoms of 91 social service workers who were impacted by and providing services to the survivors of the 2005 hurricanes impacting Louisiana. This study found that participants who received TRE/SE treatment reported significantly less psychological distress, significantly fewer PTSD symptoms, and significantly increased resiliency as compared to a matched comparison group. Though not a randomized controlled trial, this study suggests that SE/TRM was effective in mitigating the impact of the disaster on social service workers.

Two randomized controlled trials have assessed the effectiveness of SE in treating individuals with comorbid lower back pain and PTSD symptoms, comparing physiotherapeutic intervention alone to physiotherapeutic intervention in combination with SE. Anderson et al. (2017) found that at the 12-month follow-up, the group that received 6-12 sessions of SE had significantly fewer post-traumatic stress symptoms. However, a later study found no significant difference between a group that received up to 12 sessions of SE and physiotherapeutic intervention and a group that received physiotherapeutic intervention alone, though both groups had a small reduction in post-traumatic symptoms (Anderson et al., 2020). The authors of the second study suggested that these results may have been impacted by potential over-inclusion of individuals who did not meet diagnostic criteria for PTSD, as self-report questionnaires were used instead of diagnostic interviews (Anderson et al., 2020).

Finally, one randomized controlled trial (Brom et al., 2017) has assessed the effectiveness of SE for treating individuals with PTSD, as compared to a waitlist group. Both groups were

voluntarily recruited and participated in the study in Israel, over a three-year period. The study found a statistically significant decrease in post-traumatic symptoms in those who received 15 sessions of SE treatment, with a large effect size, suggesting the efficacy of SE in treating PTSD.

Concepts/Techniques from Somatic Experiencing That Support Autonomic Regulation

SE focuses on supporting clients in gradually engaging with the physical and sensory aspects of traumatic memory to restore optimal functioning to the autonomic and related nervous systems. Because SE sees autonomic dysregulation as counterproductive to therapeutic processing (Payne et al., 2015), clients' arousal is carefully tracked and regulated so that clients can remain present with the sensory experiences related to traumatic memory, supporting a discharge process (Brom et al., 2017). Several concepts and techniques used in SE and TRM to support this regulation are reviewed below. Many of these techniques can also be used by clients outside of sessions to support regulation.

Resilient Zone. One concept that is utilized in SE and more explicitly named in TRM is the "resilient zone" (Grabbe & Miller-Karas, 2018, p. 79). Drawing on Siegel's (2010) concept of the "window of tolerance" (p. 50), the resilient zone is described as a "felt sense experience where one can handle the ups and downs of life experience" (Grabbe & Miller-Karas, 2018, p. 79) and respond constructively to challenges. On either size of the resilient zone are the "high zone" (p. 79), which involves hyperarousal and excess sympathetic nervous system activation and the "low zone" (p. 79), corresponding to hypoarousal and excess parasympathetic nervous system activation. This concept is useful for psychoeducation and to normalize traumatic responses. SE helps clients widen their resilient zone and return to it when they are experiencing hyper or hypo arousal (Payne et al., 2015).

Tracking Nervous System Activation. In SE, one important role of the therapist is to monitor and track the client's nervous system activation. Therapists can obtain cues about nervous system activation from observing indicators from the respiratory and cardiovascular systems, as well as noting client's posture. For example, an individual's breathing can indicate either hypoarousal, hyperarousal, or a relaxed state. In addition, changes in heart rate are associated with different nervous system states and can be observed through the pulsation of the carotid artery in the neck. Kinesthetic markers such as an individual's posture and muscle tone can reflect nervous system activation as well. SE therapists learn to note poised postures that suggest preparation for flight, postures of rigidity and collapse (indicating a freeze response), and postures that reflect openness and relaxation (indicating regulation) (Levine, 2010). Information about nervous system activation supports SE therapists in making clinical decisions and may inform clinician behavior with the goal of supporting client regulation (Payne et al., 2015).

Activating the Social Engagement System. One strategy SE therapists use to support regulation is promoting activation of the ventral vagal branch of a client's autonomic nervous system, also known as the social engagement system (Payne et al., 2015). SE draws on Porges' (2011) polyvagal theory, which postulates that the ventral vagal system inhibits excess sympathetic activation through social engagement. SE therapists utilize intentional use of eye contact and verbal interaction to activate clients' ventral vagal system and support regulation (Payne et al., 2015).

Bringing Awareness to Sensations. In addition to tracking clients' level of regulation, SE and TRM therapists also support clients in tracking and regulating their own nervous systems through bringing awareness to body sensations. Clients are guided in noticing pleasant, unpleasant, and neutral sensations and taught to track indications of their stress reactions and

level of arousal (Grabbe & Miller-Karas, 2018; Miller-Karas, 2015). In addition, therapists teach clients to utilize awareness of positive and neutral sensations to regulate arousal. Though most people are primed to focus on negative somatic cues, intentional awareness of positive sensations can support relaxation and regulation. Focusing on positive sensations is taught early in SE and TRE treatment so that individuals can utilize this skill later in treatment to modulate arousal during trauma processing (Payne et al., 2015).

Resourcing. Resourcing is another tool that is used to support nervous system regulation in SE/TRM treatment. Resourcing involves putting someone "in touch with positive inner feelings of safety, strength, comfort, and optimism" (Payne et al., 2015, p. 8) and inviting them to explore the associated embodied experience and sensations. Therapists may use whatever is present in the moment (i.e., the experience of safety and comfort in a particular chair) to facilitate resourcing (Payne et al., 2015). Alternatively, they may engage clients in identifying internal, external, or imagined resources. Internal resources could include positive traits of the individual as well as their values and beliefs. Examples of external resources are people, places, hobbies, or spiritual beliefs that have supported the client. Imagined resources are resources clients have not yet experienced but that they can imagine. After identifying a resource, clients are encouraged to describe it. Resources can be intensified through eliciting additional details, particularly in relation to the sensory experience of the resource. Finally, individuals are supported in bringing awareness to sensations they experience in the present moment when thinking about the resource, focusing on positive and neutral sensations (Miller-Kraus, 2015).

Grounding. Grounding involves bringing awareness to the physical body in the present moment. TRM supports clients in learning this skill through inviting awareness of the body touching a surface, such as the floor, a chair, or clothing. TRM also includes a set of 10 strategies

referred to as “Help Now!” (Miller-Kraus, 2015, p. 46) skills, which are used when individuals are hyper or hypo aroused. These strategies bring awareness to external sensory experiences as well as the kinesthetic experience of the body in space, facilitating grounding. They include drinking water, tea, or juice; engaging in physical movement (walking or pushing hands against a wall) while noticing associated sensations; and observing surroundings (naming colors, noticing texture of furniture, noticing temperature in the room, and noticing sounds). These strategies are particularly useful when clients are in greater levels of distress and need support managing overwhelm and returning to their resilient zone (Miller-Kraus, 2015).

Gesturing. Gesturing is another TRM skill taught to clients to support nervous system regulation. Clinicians can bring awareness to comforting gestures that emerge spontaneously in session, or they may encourage clients to identify and engage in gestures that are self-soothing or evoke confidence or joy. Clients are encouraged to repeat these gestures slowly, often along with the therapist, while bringing awareness to sensations they experience (Miller-Kraus, 2015).

Titration and Pendulation. Many of the above techniques are foundational skills that clinicians and clients use to track and regulate a client's nervous system. Titration and pendulation build on these skills to support continued nervous system regulation during trauma processing. The term titration comes from chemistry and refers to slowly introducing two reactive substances drop by drop to avoid the explosion that would result if the substances were mixed too quickly. Similarly, in SE and TRM, titration is used to slowly introduce sensations associated with traumatic memory, often beginning by bringing awareness to memories that are more distant from the trauma itself (i.e., what the weather was like the morning of a traumatic incident (Payne et al., 2015). Once a small amount of activation is present, clients are invited to

become aware of associated sensations and encouraged to stay present, often leading to a release of tension (Grabbe & Miller-Karas, 2018).

Pendulation is another strategy used to modulate arousal during trauma processing. Pendulation refers to shifting between sensations of distress and those of well-being. This shift between activation and release reflects healthy autonomic nervous system functioning, and once nurtured, can occur spontaneously as the system works to restore balance. In SE and TRM, pendulation is facilitated through bringing awareness to positive, neutral, or less painful sensations in the body when clients are experiencing distress. In addition, while processing sensations associated with trauma, clients often experience sensations of release, such as warmth, trembling, yawning, or tingling as well as positive sensations such as energy, looseness, openness, or feeling light. Clinicians invite clients to bring attention to these sensations, facilitating awareness of this natural pendulation (Grabbe & Miller-Karas, 2018).

Discharging Activation and Completion of Survival Responses. Finally, SE/TRM supports nervous system regulation through facilitating completion of blocked survival responses and restoring balance to the autonomic nervous system. According to the theory behind SE, dysregulation of the autonomic nervous system is a result of incomplete defensive and self-protective responses stored in the body (Grabbe & Miller-Karas, 2018; Levine, 2010). During trauma processing, SE/TRM therapists guide clients in completing these responses, leading to a discharge of energy. For example, if a client is recounting an experience of immobilization, the therapist might invite the client to become aware of what part of their body wants to move. The therapist may also note postures and interrupted movements occurring during trauma processing to identify and support clients in completing these survival responses. Numerous case examples describe the release of energy associated with this completion, along with an associated lessening

of post-traumatic symptoms and an increase in the natural regulation of the autonomic nervous system post session (Grabbe & Miller-Karas, 2018; Levine, 2010; Miller-Kraus, 2015).

In this section, I focused on SE, exploring its history, the theory behind its use in trauma treatment, research on its effectiveness, and specific concepts and techniques it uses to support autonomic regulation. In the next section, I will explore these same topics in relation to ExAT, highlighting the techniques within ExAT that are used to support regulation in trauma treatment.

Expressive Arts Therapy

Though there are numerous references to the use of the arts for self-expression, healing, and self-regulation throughout much of human history, formal use of the arts in psychotherapy was established in the 1900s with the development of various arts-based psychotherapy disciplines, including art therapy, music therapy, drama therapy, and dance/movement therapy (Malchiodi, 2020). The newest of these creative art therapy approaches, ExAT emerged towards the end of the 1900s as a distinct discipline focused on both the interrelatedness of various arts modalities as well as their integration (Estrella, 2005).

Emerging initially from a community of scholars, clinicians, artists, and students at the Lesley College of Graduate School's Institute for the Arts and Human Development in the 1970s, ExAT encompasses a "diversity and multiplicity of theoretical frameworks and practical approaches" (Estrella, 2005, p. 192). Like other creative arts therapies, ExAT is essentially interdisciplinary in nature. While many founding theorists have provided unique theoretical and philosophical contributions focused on the integration of the arts and the use of the creative process for healing, other expressive therapists have drawn on other disciplines and theoretical approaches to develop practical approaches geared towards clinical work with various populations. This is true for expressive arts therapists such as Malchiodi (2020) and Richardson

(2016), who have developed guides to trauma treatment and who draw on several other approaches to trauma treatment in their work.

One central aspect of ExAT is its focus on integrating various arts modalities. Expressive therapists often utilize a multimodal (using two or more modalities separately) or intermodal (using various modalities in an integrative fashion) approach. They may use various art forms concurrently or facilitate intentional transitions between art forms as part of a therapeutic intervention (Estrella, 2005). Instead of developing extensive skills in each art modality, expressive therapists focus on developing attunement to each modality's unique properties as well as the client's experience with them to identify when to introduce a modality or facilitate a transfer between modalities (Estrella, 2005). Because of this, expressive therapists are sometimes described as using a "low skill-high sensitivity" (Knill et al., 1995, p. 149) approach.

One tool expressive therapists may use to make decisions about how to introduce various modalities and interventions is the expressive therapies continuum (ETC), a model developed by Kagin and Lusebrink (1978) to conceptualize different levels of expression and information processing that occur when clients are engaging in expression through the arts. Three of these levels, the kinesthetic/sensory, the perceptual/affective, and the cognitive/symbolic, are hierarchically organized based on increasing complexity of emotional and cognitive development. The ETC can support clinicians in choosing clinically appropriate interventions and assess how a client is processing information in any given intervention.

In addition, ExAT focuses on the interrelatedness of various art forms. For example, Knill et al. (1995) draw on the theory of polyaesthetics, which highlights the similarities between art forms, recognizing that each has the "seeds" (Estrella, 2005, p. 193) of others. For example, "within music… lies the rhythm of dance; the structure, form, and color of art; the phrasing and

lyricism of poetry; and the motifs and stories of dramatic enactment" (p. 193). This theory highlights similarities in the sensory experience of various art forms and in how they can be used to communicate meaning. Estrella also pinpoints sensory and image-based expression as unique aspects of ExAT, drawing on Johnson (1985) to argue that the arts are "uniquely beneficial in their capacity to access experience, thoughts, and feelings that do not depend exclusively on either verbal language or narrative discourse" (Estrella, 2005, p 187).

Expressive arts therapists such as Cathy Malchiodi (2020), Carmen Richardson (2016), and others have theorized that several unique aspects of ExAT make it particularly useful for trauma treatment and have written guides focused on its application. For example, ExAT is theorized to be useful for trauma treatment because of its integration of non-verbal modes of communication. As previously discussed, traumatic memories are often stored as implicit memories, without a language-based or narrative component. In fact, during traumatic events, Broca's area, which controls language, is turned off, leaving trauma survivors with difficulty talking about their experiences (Richardson, 2016). Because the arts provide options for non-verbal communication, they can allow survivors to communicate and process traumatic memories, even if they cannot describe them verbally.

In addition, the sensory aspects of ExAT are key to its usefulness in trauma treatment. Engaging with the arts includes "visual, tactile, olfactory, auditory, vestibular, and proprioceptive experiences" (Malchiodi, 2020, p. 25). Because implicit traumatic memory is stored primarily as a sensory experience, ExAT can help access it to support trauma processing. In addition, the sensory components of the creative arts can be used to support individuals in self-regulating emotions and reducing arousal (Richardson, 2016). Positive, repetitive, sensory, and kinesthetic experiences such as drumming, fingerpainting, and coloring can be used to

engage the parasympathetic nervous system to support relaxation and reduce stress responses (Malchiodi, 2008).

Finally, several other aspects of the ExAT have been theorized as mechanisms through which it may reduce PTSD symptoms. Because ExAT is action-oriented, it can increase self-efficacy and survivors' sense of mastery over trauma experiences (Malchiodi, 2020). Trauma treatment with ExAT often utilizes the arts to support individuals in re-telling their trauma narratives, integrating cognitive restructuring to reprocess and reframe trauma memories (Malchiodi, 2020). Due to the arts' capacity to facilitate externalization, integrating the arts when exploring traumatic material can facilitate greater containment, supporting individuals in experiencing a greater sense of agency and empowerment. In addition, the utilization of symbolic expression can make exposure to traumatic memories more tolerable and reduce avoidance (Baker et al., 2018). Finally, the imaginative, playful, and pleasurable aspects of ExAT can support individuals in imagining new meaning and reconnecting to a sense of aliveness (Malchiodi, 2020).

Research on Expressive Arts Therapy and Trauma Treatment

Though there is an emerging body of literature on the use of the creative arts therapies in trauma and PTSD treatment with adults, research demonstrating their efficacy is limited. In fact, Baker et al. (2018) completed a systematic review of the efficacy of the creative arts therapies on treating adults with PTSD. They found seven studies that met the criteria for review, stating that among these the quality of the trials was poor and calling for well-designed, methodologically rigorous trials to assess the efficacy of the creative arts therapies for treating post-traumatic symptoms. While there are there are several qualitative and quantitative studies on music therapy (Bensimon et al., 2008; Carr et al., 2012) and art therapy (Berberian et al., 2019; Campbell et al.,

2016; Goodarzi et al., 2020; Hass-Cohen et al., 2018; Henderson et al., 2007; Lubbers, 2019; Özkafacı et al. 2020; Strouse et al., 2021) in trauma treatment, no empirical studies assessing the effectiveness of ExAT in trauma treatment with adults were found in this literature review. Baker et al. (2018) cited several factors that have contributed to the limited research available on the creative arts therapies in trauma treatment, including challenges gaining funding due to their interdisciplinary nature, as well as their relatively recent development.

Concepts/Techniques from Expressive Arts Therapy That Support Autonomic Regulation

Unlike SE, which focuses primarily on addressing trauma through restoring optimal functioning to the autonomic nervous system, the literature on ExAT and trauma focuses on several different goals, including reduction in post-traumatic symptoms, increased capacity for self-regulation, increased embodiment, facilitation of communication, increased self-efficacy, re-framing of trauma experiences, imagining new meaning, and restoring aliveness and connection (Malchiodi, 2020). However, promoting safety and regulation is an important aspect of ExAT in trauma treatment. Expressive arts therapists such as Malchiodi (2020) and Richardson (2016) emphasize the importance of building a foundation of safety and regulation early in treatment that can be returned to in order to facilitate regulation as needed during trauma processing. Like SE/TRM, Malchiodi (2020) argues that trauma-informed expressive arts therapy should include identifying and monitoring a client's window of tolerance during treatment to prevent re-traumatization or reinforcement of trauma memories. The literature on expressive arts therapy and trauma treatment highlights several different strategies that can be used to facilitate autonomic regulation during trauma treatment, reviewed below.

Attunement, Mirroring, and Entrainment. Supporting attunement is one important strategy for facilitating autonomic regulation discussed in the literature on expressive arts

therapy and trauma. Attunement involves not only understanding what someone else might be feeling, but also communicating this understanding through body language, touch, facial expressions, and tone of voice (Malchiodi, 2020). Kossak (2015) describes attunement in ExAT as a type of embodied empathy that requires the therapist to consciously tune into bodily experience as well as the artistic experience. Attunement is a key part of supportive relationships and can be enhanced through "repetitive, relational experiences found in movement, music, and play-based interventions" (Malchiodi, 2020, p. 108), such as those used in ExAT.

Attunement and self-regulation can also be promoted through specific ExAT techniques such as mirroring and entrainment. Mirroring involves "the embodiment or reflection of an individual's movement or non-verbal communication" (Malchiodi, 2020, p. 175). For example, it may include a therapist mirroring a client's movements, inviting a client to mirror the therapist's movements, or activities that involve mirroring the marks or lines in a drawing.

Entrainment involves the experience of rhythmic synchronization (i.e., one rhythm synchronizing with another). Music can be used in ExAT in order to facilitate relaxation and regulation through entrainment, as an individual's heartbeats and/or respiration will unconsciously adjust to the rhythms present. One way to encourage autonomic regulation through entrainment is by matching the client's rhythms and then slowly reducing the tempo (Ghetti et al., 2015). A therapist's voice and movements can also be used to promote entrainment, or entrainment can be encouraged during multimodal expression through inviting individuals to draw or move to music (Malchiodi, 2020).

Engaging in Positive Sensory and Kinesthetic Experiences. The sensory and kinesthetic aspects of ExAT can also be used to support regulation and reduction of arousal (Richardson, 2016). Positive sensory and kinesthetic experiences such as drumming, finger

painting, and coloring can help to activate the parasympathetic nervous system and promote relaxation (Malchiodi, 2008). Spiegel et al. (2006) suggest that the sensory aspects of art expression can help make the exploration of traumatic memory more tolerable and reduce avoidance. The auditory experience of certain types of music can be particularly helpful in promoting autonomic regulation and supporting the body's sense of safety. Malchiodi (2020) suggests that "music that has the tempo of a resting heartbeat, slower rhythms, low pitch, and no lyrics is generally relaxing for most people and modulates arousal levels" (p. 149). Background music can be used in combination with other ExAT activities, or music listening can be used as a standalone intervention. It is important to note that individuals' comfort with sensory experiences vary. Expressive arts therapists work with each client to identify sensory experiences that are comforting and soothing to them, as certain sensory experiences can also lead to dysregulation if associated with traumatic memories (Malchiodi, 2020).

Kinesthetic activity can promote regulation through supporting the discharge of excess energy created during stress responses, increasing a sense of self-control, and helping individuals in orienting in space (Malchiodi, 2020). Bilateral drawing is one technique that draws on kinesthetic experience to support individuals who are experiencing hyperarousal or a freeze response. Clients are encouraged to make large marks with both hands, adding an active element to the drawing. This can help bring attention away from distressing sensations, reduce anxiety, and decrease feelings of being trapped. Rhythmic kinesthetic experiences such as drumming, dancing, and certain types of drawing also support nervous system regulation. Individuals can also be invited to identify and explore a movement that feels soothing to them (Malchiodi, 2020).

Grounding and Anchoring. Malchiodi (2020) describes several grounding techniques used to support individuals in focusing on external reality and the present moment through

utilizing the senses. She notes ExAT naturally facilitates grounding due to its sensory aspects and active engagement of the body. In addition to engaging in sensory experiences (smelling essential oils, tasting a pungent candy, holding tactile objects), and strategies like those discussed in the section on SE/TRM techniques, Malchiodi (2020) suggests integrating expressive arts with grounding in order to facilitate anchoring, which she describes as "the process of using specific cues or experiences to bring one's attention to the present moment" (p. 169). For example, expressive arts can be used to create a specific object (i.e., anchor) that clients can carry with them as a reminder of a grounding experience (Malchiodi, 2020).

Identifying and Exploring Resources. Like SE/TRM, ExAT also utilizes resources as a tool for autonomic regulation in trauma treatment. Richardson (2016) describes identifying and developing resources as key to regulation and safety in treatment. Though her work focuses on trauma treatment with children, many of the concepts and frameworks she uses translate to working with adults. She identifies several different types of resources that can be explored using ExAT, including internal, external and body-based resources. In addition, she describes resources that are inherent to the ExAT process, such as self-expression, imagination, the creation process, and the art product. Richardson (2016) lays out techniques for engaging with resources through ExAT, emphasizing using various art forms to explore and represent the resource and awareness of associated sensations.

Malchiodi (2020) also describes the use of positive sensory memories as resources for self-soothing and draws on Rappaport's (2009) work on focusing-oriented ExAT (FOAT) to support the development of resources in adults. Though not exclusively used for trauma treatment, FOAT is a trauma-informed method that integrates focusing and ExAT to identify and explore resources. In FOAT, individuals learn to access the body's "felt sense" (Rappaport,

2009, p. 28), or internal sense of an issue or resource, and are then invited to further explore this felt sense through creative expression. Prompts that are used to identify resources include a "peaceful place," (p. 141) "source of strength," (p. 174) and the "focusing attitude" (p. 26), a concept from focusing that refers to bringing friendliness and curiosity to internal experiences. These resources, as well as the practice of bringing awareness to the felt sense, can be used to facilitate regulation (Malchiodi, 2020).

Externalization/Aesthetic Distance/Containment. Finally, expressive arts therapy can support the management of regulation during trauma treatment through facilitating clinically useful distance between the client and traumatic material. This is referred to by drama therapist Landy (1996) as "aesthetic distance" (p. 25). Aesthetic distance exists between "underdistance" (p. 25) (emotional flooding that makes reflecting difficult) and "overdistance" (p. 25) (rational thought with removal of feelings) and refers to a distance where reflection and emotion are possible.

Various ExAT techniques can be used to facilitate aesthetic distance. For example, the use of imaginative stories and dramatic enactment can allow individuals to tell their stories through metaphor or alternate characters, increasing tolerability of trauma processing. In addition, expressive arts can support clients in externalizing feelings and experiences associated with traumatic material. For example, drawing "provides a way to make tangible a sensation or feeling, placing outside oneself on paper… [and gives] individuals ways to separate from what is going on internally" (Malchiodi, 2020, p. 26). Projection can also be used to establish safe distance from emotions associated with traumatic memories. For example, clinicians can invite individuals to create a representation of an emotion (i.e., fear), and then invite them to explore what this representation could say if it could talk (Malchiodi, 2020).

Finally, ExAT can support greater control over emotions through facilitating containment. For example, clients can create containers (boxes, bags, and pouches) to metaphorically store difficult emotions in during trauma treatment (Richardson, 2016). Containment can also be facilitated through drawings that involve borders and boundaries, such as body outlines (when portraying sensations associated with trauma), or a circle outline to encompass a mandala filled with symbols of emotions related to trauma (Malchiodi, 2020; Henderson et. al., 2017). In the FOAT "clearing a space" (Rappaport, 2009 p. 105) exercise, individuals are invited to use visuals (i.e., bubbles, packages) to imagine setting aside anything between them and feeling "all fine" (p. 105). These images create visual reminders of containment and can facilitate a greater sense of control for clients, facilitating regulation.

Literature on Integrating SE and ExAT

Though SE and ExAT share several similarities in their approach to facilitating autonomic regulation in trauma treatment, little has been written on the connections between these two methods. Expressive arts therapists such as Malchiodi (2020) and Richardson (2016) draw on concepts from SE such as pendulation and titration, as well as Levine's (2010) theories and techniques, in their work on ExAT and trauma treatment.

In addition, one form of art therapy, sensorimotor art therapy, integrates elements from SE. Sensorimotor art therapy was developed by Elbrect (2019), an art therapist who has also trained in SE, and focuses on using bilateral drawing and work with the clay field, a large flat box filled with smooth clay. As a bottom-up approach to trauma treatment, sensorimotor art therapy focuses on using these methods to express interoceptive sensations and motor impulses, access implicit trauma memories, and create new, more positive, sensorimotor experiences (Elbrecht, 2019; Elbrecht & Antcliff, 2014). For example, with bilateral drawing, individuals

create rhythmically repeated lines and shapes in order to express their internal sensory experience and then add lines and shapes related to their inner sense of what is needed to release the tension in their body (Elbrecht, 2019). Therefore, bilateral drawing integrates SE's focus on tracking internal sensation and releasing traumatic activation through movement with the sensory and kinesthetic aspects of art therapy.

Discussion

This literature review explored the ways that SE and ExAT can support autonomic dysregulation in trauma treatment. Both SE and ExAT incorporate several concepts and techniques that can be used to facilitate regulation during trauma treatment. In my review of these techniques, several themes emerged. In this section, I describe these themes, highlighting the similarities and unique contributions of SE and ExAT. I also provide recommendations for how SE and ExAT could be integrated or inform each other to support autonomic regulation in trauma treatment, as well as recommendations for further exploration and research.

Themes

Window of Tolerance/Resilient Zone. The concept of the resilient zone or client's window of tolerance is utilized both in SE and ExAT (Grabbe & Miller-Karas, 2018; Malchiodi, 2020). Both modalities focus on supporting clients in building a foundation of safety and regulation before exploring traumatic memory. Both utilize a variety of techniques to support clients in returning to their resilient zone/window of tolerance during trauma processing when they are experiencing autonomic dysregulation.

Titration and Pendulation. Titration and pendulation are two concepts from SE that expressive arts therapists such as Malchiodi (2020) have also used to support regulation during trauma processing. The goal of titration is to bring up small amounts of activation and gradually

increase the intensity as individuals develop the capacity to handle more activation (Grabbe & Miller-Karas, 2018). In SE, this is facilitated by beginning with memories that are further from the traumatic incident. ExAT techniques such as externalization and aesthetic distance could also be used to facilitate titration, as they allow for arousal modulation during trauma processing through providing distance between the client and traumatic material (Malchiodi, 2020). In addition, the sensory and kinesthetic elements present in the arts can be used to modulate arousal and therefore could support titration.

Pendulation in SE refers to shifting between experiences of arousal and well-being. In SE, therapists facilitate pendulation by helping clients shift back to regulation when they are beginning to experience higher levels of arousal, primarily through focusing on positive resources or sensations. Many of the tools utilized in ExAT to facilitate regulation could be used as part of the pendulation process, including incorporating ExAT-specific social engagement strategies, and bringing awareness to positive sensory and kinesthetic experiences or resources.

Use of Social Engagement. Both SE and ExAT incorporate the use of social engagement in order to facilitate regulation and safety in trauma treatment (Malchiodi, 2020; Payne et al., 2015). SE primarily focuses on the use of eye contact and verbal interaction in order to facilitate social engagement and support regulation. ExAT incorporates several additional techniques that can support activation of the social engagement system (Malchiodi, 2020). For example, expressive arts therapists can facilitate attunement through relational expressive arts interventions utilizing repetition, music, movement, and play, and specifically through activities that involve mirroring or entertainment (Malchiodi, 2020).

Use of Positive Interoceptive, Sensory, and Kinesthetic Experiences. Both SE and ExAT integrate the use of positive interoceptive, sensory, and kinesthetic experiences to support

regulation (Grabbe & Miller-Karas, 2018; Malchiodi, 2020; Richardson, 2016). SE focuses primarily on bringing client awareness to positive or neutral interoceptive sensations to facilitate regulation (Payne et al., 2015). ExAT includes some amount of interoceptive awareness, while also utilizing sensory and kinesthetic experiences to facilitate regulation. For example, individuals may engage in positive sensory arts experiences such as finger painting or rhythmic kinesthetic activity such as drumming or bilateral drawing. Or certain types of music may be incorporated into expressive arts interventions as a sensory experience to support regulation (Malchiodi, 2020). In addition, positive kinesthetic experiences are utilized in TRM through the skill of gesturing, which involves engaging in self-soothing and comforting movements (Grabbe & Miller-Karas, 2018). Finally, both ExAT and TRM utilize engagement with positive/neutral kinesthetic and sensory experiences to facilitate grounding when clients are in greater levels of distress or experiencing dissociation (Grabbe & Miller-Karas, 2018; Malchiodi, 2020).

Utilizing Resources. Both SE/TRM and ExAT utilize identification and intensification of resources to facilitate regulation (Malchiodi, 2020; Miller-Kraus, 2015). In SE, resources are identified and intensified through a process of bringing the resource to mind and eliciting additional details about the resource, including sensory details. Finally, individuals are invited to notice the interoceptive sensations they experience when thinking about the resource, focusing on positive and neutral sensations (Miller-Kraus, 2015). In ExAT, resources can be further explored and intensified through utilizing the arts to embody and/or create representations of them. In addition, these representations can involve objects that can serve as a reminder of the resource to facilitate future regulation (Malchiodi, 2020).

Unique Contributions from SE and ExAT

This literature review revealed several unique contributions of SE and ExAT in supporting regulation in trauma treatment, some of which were described in the themes above. In addition, several other unique contributions were found. For example, SE involves a greater emphasis on the therapist's role in tracking the client's nervous system activation through respiratory, cardiovascular, and kinesthetic cues. SE therapists are also trained to support discharge of nervous system activation through completion of survival responses.

Furthermore, this literature review revealed several unique contributions from ExAT. The use of the arts is one unique contribution from ExAT, as the arts involve sensory and kinesthetic qualities that can be inherently regulating. The variety of modalities and interventions in ExAT can allow for customization of treatment based on client preferences and needs. For example, some clients may find bringing attention to the body and interoceptive awareness triggering. These clients may benefit from the active, external, and concrete elements of ExAT. In addition, though often clients find positive sensory and kinesthetic experiences regulating, Malchiodi (2020) highlights how some survivors may self-regulate through a cognitive focus. These clients may benefit from beginning with more narrative or cognitive trauma processing before incorporating sensory, kinesthetic, and interoceptive awareness. Because ExAT can involve both body-based and cognitive processing, it can be customized based on clients' needs.

Recommendations for Integration

The themes and unique contributions described above suggest several ways that SE and ExAT could be integrated to facilitate regulation in trauma treatment. For example, within SE treatment, expressive arts interventions could be used to further support intensification of resources (through individuals drawing or acting out resources) and the activation of the social engagement system (through interventions involving mirroring or entrainment). In addition,

ExAT therapists could draw on the structure and concepts from SE, such as titration and pendulation, to develop more step-by-step guides or models for trauma treatment with adults.

The techniques and concepts described in this literature review could also be combined to create an SE/ExAT integrated model for trauma treatment. This model could involve an early stage of treatment focused involving psychoeducation on trauma and the resilient zone as well as the development of tools and strategies clients can use to return to their resilient zone. SE and ExAT techniques that support regulation, such as exploring positive interoceptive, sensory, and kinesthetic experiences, identifying and intensifying resources, and activating the social engagement system could be used as part of this stage.

A later stage of treatment could include trauma processing through either SE or ExAT techniques depending on the training of the therapist and the needs of the client. The SE concepts of titration and pendulation could be applied in this stage, and ExAT techniques such as externalization, aesthetic distance, containment, and sensory and kinesthetic engagement could be utilized as relevant to support titration. Pendulation could be supported through incorporating regulatory strategies previously developed in the initial stage as needed to help clients remain in their resilient zone.

One consideration for integrating SE and ExAT in trauma treatment is the training and skills of the therapist. SE therapists looking to integrate ExAT into their work may need additional training in ExAT. In addition, ExAT therapists may need training to facilitate certain SE techniques, especially those associated with trauma processing. Literature on TRM may be useful for expressive arts therapists looking to integrate aspects of SE in their work, as TRM has identified a subset of skills that support autonomic regulation that anyone can learn regardless of clinical training. In addition, even if they do not plan to utilize SE techniques, ExAT therapists

may benefit from further training on certain SE skills, such as facilitating interoceptive awareness and tracking clients' nervous system activation, as this may increase their effectiveness in ExAT-focused trauma treatment.

Recommendations for Further Research

This literature review highlighted the need for continued development and evaluation of non-established trauma treatment methods. Though both SE and ExAT are promising methods for trauma treatment with adults, research on their efficacy is limited. Many studies exploring the use of SE and the creative arts therapies with trauma and PTSD have methodological problems that limit their validity or generalizability, including lack of control groups, small sample sizes, or lack of appropriate validated outcome measures (Baker et al, 2018). Though some research on the creative arts therapies and trauma treatment exists, no empirical studies exploring the efficacy of ExAT in trauma treatment were found in this literature review.

Due to the limited evidence for SE and ExAT, additional research assessing their use in trauma treatment is needed. Specifically, well-designed randomized controlled trials would provide the most evidence. In addition, comparative trials incorporating other treatment modalities could help to clarify whether methods such as SE and ExAT are more tolerable than other methods. Research on ExAT in trauma treatment may also benefit from the development of specific methods/models that could be reproduced and are therefore easier to assess.

Finally, further research could be done on the effectiveness of SE and ExAT in supporting regulation in trauma treatment. Specifically, research could focus on the effectiveness of specific techniques and methods in SE and ExAT, such as those described in this review to assess their effectiveness in reducing arousal. Baker et al. (2018) argue for the importance of isolating specific mechanisms of action such as "whether relaxation experienced during art

therapy reduces hyperarousal, or whether symbolic expression makes progressive exposure tolerable and helps overcome avoidance" (p. 648-649). This research would help to provide support for the use of SE and ExAT to support regulation in trauma treatment and could provide additional information about which techniques are the most effective.

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