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Child Traumatic Stress and the Sacred: Neurobiologically Informed Interventions for Therapists and Parents

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Abstract: Children experience trauma and adverse experiences at an alarming rate. The negative impact of traumatic experiences on a child's developing brain is pervasive, adversely affecting one's thoughts, feelings, behaviors, physiological reactions, and social relationships. Conversely, the nature, pattern, timing and duration of therapeutic experiences can change the brain in ways that support and cultivate therapeutic growth and healing. The purpose of this paper will be to review and expand on two prominent neurobiological therapeutic frameworks within the field of child trauma therapy: the Neurosequential Model of Therapeutics and Interpersonal Neurobiology. We will discuss the ways in which trauma experiences are organized in the brain and how therapeutic and parenting interventions can address the key areas of the brain that are impacted. Further, this paper will expand on these frameworks to explore how the sacred (within primarily a Judeo-Christian monotheistic religious tradition) can be integrated within the therapeutic process—specifically through the themes of safety, relational connection, and meaning-making.

Keywords: child trauma; spiritually integrated psychotherapy; neurobiology; neurosequential model of therapeutics; interpersonal neurobiology; spirituality; interventions; parenting



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1. Introduction

In an ideal world, children would grow up in an environment in which they feel safe and loved. However, all too often, children experience psychologically traumatic events that produce significant stress, leading to feelings of fear and shame. According to the National Child Traumatic Stress Network (NCTSN), “Child traumatic stress occurs when children and adolescents are exposed to traumatic events or traumatic situations that overwhelm their ability to cope.” The event, experienced or witnessed, threatens the physical or emotional wellbeing of the child and adversely affects the functioning of the child in a variety of ways. Research has estimated that 64–80% of children in the United States have experienced at least one traumatic event prior to 17 years of age ([Preventing Adverse Childhood Experiences 2020](#); [Copeland et al. 2007](#); [Turner et al. 2010](#)). Furthermore, most children who experience traumatic events experience more than one type, with 12.5% of children experiencing four or more distinct trauma events ([Preventing Adverse Childhood Experiences 2020](#)). This is alarming as the impact of childhood traumatic stress can have lasting effects well into adulthood, and has been linked to a number of mental and physical health conditions, risky health behaviors, and socioeconomic challenges. Additionally, the more adverse childhood experiences one has encountered, the higher the risk for these negative outcomes ([Preventing Adverse Childhood Experiences 2020](#)). It is important to note, however, that not all children exposed to a traumatic event develop traumatic stress or lasting trauma symptoms. The level of impact on the child is often dependent on several risk and protective factors, including the severity of the event, the proximity of the event, caregiver reactions, prior history of trauma, and available resources to the child/family ([Peterson 2018](#)). While the events may be objective, the traumatic experience is highly personal and subjective to the child, which is why some children who are exposed to the same event are impacted in different ways.

The development and impact of symptoms may be more severe if the child has pre-existing mental health conditions (e.g., depression), reacts to the event with intense fear, and/or lacks effective coping skills to manage their thoughts/feelings after the event (Alisic et al. 2011; Trickey et al. 2012).

There are several adverse childhood experiences that could lead to traumatic stress, including, but not limited to, the following: physical, sexual, and psychological abuse and neglect, family or community violence, sudden or violent loss of a loved one, natural or technological disasters, bullying, medical trauma, and acts of terrorism. Other experiences may also lead to chronic stress. These might include parental divorce, the loss of a close relationship, or the death of a pet. Research has shown that the more traumatic events a child or adolescent experiences, the higher the level of potential short-term as well as long-term impairment (Copeland et al. 2007). More so, experiencing more than one type of trauma as opposed to repeated instances of the same event can also lead to more and greater severity of symptoms (Turner et al. 2010).

Children and adolescents who develop traumatic stress after such events may go on to develop a variety of symptoms across several different domains. According to the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), trauma symptoms might include intrusive thoughts or re-experiencing the event or situation, persistent avoidance of trauma associations, negative alterations in cognitions and mood, and marked alterations in arousal and reactivity. The impact of these symptoms is rather pervasive and impairs a child's thoughts, feelings, behaviors, and physiology. Children often experience symptoms in a different manner than adults, and this clinical expression after a perceived traumatic event varies across developmental ages of children and adolescents (American Psychiatric Association 2013).

Examples of intrusive thoughts or symptoms of re-experiencing include distressing memories, nightmares, flashbacks, or distress associated with the trauma event or situation. In children (especially young children [0–5]), trauma memories or triggers are not always experienced as distressing and these symptoms might be exhibited during play interactions. Thematic content in play can be literal or symbolic to the traumatic experience. Young children may appear consumed by the traumatic event (e.g., repetitive statements or questions around certain aspects of the event). Child survivors of trauma may report nightmares specific or unrelated to the traumatic event. In addition, young children may exhibit significant physiological symptoms (e.g., sweating, disrupted breathing). Moreover, young children may exhibit dissociative symptoms (e.g., blank stares; unresponsive) upon exposure to trauma reminders (American Psychiatric Association 2013; Zero to Three 2016).

Avoidant symptoms might include conscious efforts to evade associated memories, thoughts, or feelings related to the traumatic event, or the avoidance of people, places, or activities that remind the child or adolescent about the event. In young children, this may be linked to restricted play behaviors or limited exploration of the environment. School-age children may avoid participation in activities they used to enjoy or limit their participation in new activities. Older children and adolescents may be reluctant to engage in developmentally appropriate behaviors (e.g., dating, driving; American Psychiatric Association 2013; Zero to Three 2016).

Negative alterations in cognitions and mood might include negative or distorted thoughts, persistent negative feelings (e.g., fear, guilt, sadness, shame, confusion) or inability to experience positive feelings, diminished interest in activities, detachment in relationships or social withdrawal, or dissociation. Young children often have difficulty managing their emotions due to developmental difficulties in understanding and identifying feelings, and expressing thoughts. Adolescents tend to be self-critical, may identify with feelings of weakness, and tend to feel more intense shame. Moreover, adolescents may feel undesirable and hopeless about the future, which often impairs their social relationships (American Psychiatric Association 2013; Zero to Three 2016).

Marked alterations in arousal and reactivity may include increased irritability or anger, self-destructive behaviors, attention difficulties (e.g., hypervigilance or poor concentra-

tion), exaggerated startle response, or sleep disturbance. Young children do not always express overt fear reactions during the trauma or when exposed to trauma triggers. Rather, they may exhibit a wide-range of negative emotions (e.g., excessive crying) or disruptive behaviors (e.g., anger outbursts; tantrums). Children and adolescents may become more irritable and aggressive, which tends to adversely impact peer relationships and academic success. In addition, older children and adolescents tend to engage in more risk-taking and dangerous behaviors, which could result in injury to self or others ([American Psychiatric Association 2013](#); [Zero to Three 2016](#)).

The impact of trauma can have profound effects on brain development and attachment formation ([Perry 2006, 2009](#); [Siegel 2012](#); [Siegel and Bryson 2012](#)), particularly in early developmental trauma experiences (ages 0–5) and/or when children experience multiple traumatic events (i.e., complex trauma). Advances in neuroscience and neurobiology have provided many insights into how we understand the impact of trauma on the developing brain as well as how to help children heal from trauma in a developmentally sensitive manner.

2. A Neurosequential Understanding and Approach to Child Trauma

The Neurosequential Model of Therapeutics (NMT) was developed by Bruce Perry, MD, PhD, a child psychiatrist who specializes in childhood trauma. NMT is not a therapeutic technique or intervention per se; rather, it is a conceptual framework that can guide assessment, intervention, and treatment planning in work with child trauma survivors. It is a developmentally sensitive therapeutic approach incorporating core principles from neurobiological and trauma research, and has been found to be effective in improving attachment relationships, increasing affect regulation, and decreasing disruptive behaviors ([Perry 2006, 2009](#)). The NMT approach begins with the assessment of experiences and relationships (both past and present) that contribute to the risk and resilience of a child—this better informs the clinician of the strengths and needs of that child. This assessment helps inform the “brain mapping” process, which plots areas of the brain on a table that are likely impacted based on the severity and timing of adverse childhood experiences. Based on the map of the brain in this manner, recommendations are made to the childcare provider that help guide the selection and timing of developmentally sensitive therapeutic interventions (which are detailed further below). The full NMT approach is much more extensive than what can be summarized within the scope of this paper, but even a concise outline of its main principles can provide a therapeutic backdrop and helpful information regarding trauma and brain development, as well as recommendations for treatment. According to NMT, the brain organizes and develops from the “bottom-up” as a reflection of developmental experience (e.g., from brainstem to cortex). The brain is underdeveloped at birth and develops most rapidly early in life. Due to this, early developmental experiences have a greater impact on the brain than later developmental experiences ([Perry 2006](#)). All sensory information initially enters through and is processed by the lower brain levels (e.g., brainstem, diencephalon), which influence the response patterns of the higher levels (e.g., limbic system and cortex; [Perry 2006](#)). Further, the brain organizes in response to the pattern, intensity, and nature of perceptual and sensory experiences. Neural systems can change, but some systems are understood to be more readily changed than others. Accordingly, a key insight of NMT is that it takes less time, intensity and repetition to organize the developing neural systems than to re-organize already-developed neural systems ([Perry 2006, 2009](#)).

In the following sections, we will discuss many of these underlying principles of neurodevelopment in further detail, including the structure and functions of the brain, sensory input and processing in the brain, arousal states and needs in the brain, and developmentally appropriate, brain-based interventions. All of these will be discussed in light of trauma experiences. The final piece of this section will present a case study integrating these principles. For further reading of Bruce Perry and the neurosequential model of therapeutics, refer to the relevant list of his work in the References ([Gaskill and Perry 2014](#); [Perry 2000, 2006, 2008, 2009](#)). In addition to these, one of Bruce Perry’s seminal

books in the field of developmental trauma is *The Boy who was Raised as a Dog* (Perry and Szalavitz 2017), which describes the impact of trauma on the developing brain and how to help children heal from adverse experiences in a neurodevelopmentally informed manner.

2.1. The Structure and Functions of the Brain

The brain is organized and develops in a hierarchical and sequential manner from the brainstem, to the diencephalon/cerebellum, to the limbic system, to the cortex (Perry 2006, 2009). Although each section has separate functions, they are interrelated and operate in conjunction with one another through a multitude of neural networks and neurotransmitters (Perry 2009). Under typical circumstances (e.g., a 'healthy enough' environment), these networks develop organically, making possible efficient communication between the brain regions. When these networks are disrupted by trauma or other forms of adverse childhood experiences, however, brain regions become dysregulated, and the functioning within and between these regions can become impaired (Gaskill and Perry 2014).

The brainstem, sometimes referred to as the survival brain, develops in utero and grows most rapidly during the first year of life (Perry 2006, 2009). Changes to the brainstem after the first year of life require intense, recurrent experiences (Perry 2006). The brainstem is largely responsible for essential bodily functions and regulation of survival mechanisms, including respiration, body temperature, heart rate, blood pressure, and threat perception (Perry 2006; Siegel 2012; van der Kolk 2015). Memories that are state-dependent and associated with arousal (e.g., physiology) are implicit and are understood to be stored largely in the brainstem (Perry 2006). This helps to explain the level of alertness and amount of attention one exhibits in a given situation. It can also explain why a child has difficulty breathing or paying attention when they are scared.

Next in sequential order is the diencephalon, or cerebellum, which develops most rapidly in early childhood (i.e., 6 months to 2 years old; Perry 2006, 2009). The diencephalon is largely responsible for regulatory systems in the body, such as sleep, appetite/satiation, and arousal. It also involves sensory integration (i.e., ability to receive, organize, and respond to various sensations in our body or the environment) and motor regulation (e.g., balance, coordination; Perry 2006). This allows a person to make meaning of their experiences, accomplish daily activities, and move in a coordinated manner. Procedural memories (e.g., implicit, unconscious habits) are primarily stored in the diencephalon (Perry 2006). Procedural memories are important in motor (e.g., walking) and language development (e.g., talking). Procedural memories can help explain why a child hides or covers their ears when they hear a loud noise.

The limbic system, often referred to as the emotional brain, is next to develop and matures most rapidly between one and four years of life; it develops through various interactions with the environment (Perry 2006, 2009). The limbic system is largely responsible for emotional reactivity, attachment and relational connections, and motivation (Panksepp 2004; Perry 2006; Siegel 2012; van der Kolk 2015). Memories that are linked to emotions are largely stored in the limbic system (Perry 2006). Specifically, the amygdala holds the emotional significance of a particular event, including the intensity and impulse of the emotion. The amygdala helps a person effectively process emotions and is linked to fear responses. Repeated, traumatic stress creates a fear response that is largely automatic (Perry 2006). This can help explain why a child becomes increasingly anxious when exposed to seemingly mild trauma reminders (e.g., the smell of a person's cologne).

Finally, the cortex (or neocortex) is sometimes referred to as the executive brain, and develops last in the sequence of brain development. The cortex matures rapidly during the preschool years, but does not become fully developed until the mid 20s (Perry 2006, 2009). The cortex is largely responsible for various executive cognitive functions, including advanced relational capacities (e.g., affiliation/reward), reasoning, problem solving, abstract thought, and language. In addition, the prefrontal cortex contributes to planning, decision-making, impulse-control, and goal setting (Perry 2006; Siegel 2012; van der Kolk 2015). Memories associated with thoughts or cognitions are primarily stored

in the cortex (Perry 2006). This can help explain why a child ruminates (e.g., cannot stop thinking about) over an event that was traumatic or highly stressful. This might be triggered by hearing a name, seeing a face, or receiving information about something related to a particular traumatic event (Perry 2006).

2.2. Sensory Input and Processing in the Brain

All sensory stimuli (e.g., events or objects received from the senses) experienced from the environment or inside the body alter how the brain develops and functions throughout childhood and beyond. Response patterns in the present are largely influenced by how the brain has processed and filtered this sensory input from past experiences (Perry 2006). When a stressful situation (of low to moderate intensity) experienced in the past is anticipated to occur again in the future, the stress response system is able to effectively manage the sensory stimuli, often leading to increased resilience. However, when the stress response system is triggered by a traumatic experience (e.g., intense, unexpected, and/or overwhelming), the brain makes a connection between the experience and the associated sensory stimuli, which can set the stage for the conflation of past and present events even when the present events are distinct from the past (Gaskill and Perry 2014). Particular patterns of repeated experiences initiate recurring activation of the nervous system, resulting in a process called sensitization. This pattern of neural activation results in an altered, more sensitive brain state, creating various state-dependent memories held in the brain (Perry 2006). Threatening situations throughout one's childhood can thus create a persistent fear state, or a pervasive pattern of emotional and behavioral dysregulation (e.g., trait). Once the brain has been sensitized, the same neural activation can be elicited by less and less intense external stimuli. As such, minor stressors (e.g., trauma triggers) can potentially elicit significant or extreme response patterns even when there is no specific threat in the present moment (Perry 2006). In other words, the body stores and *remembers* a trauma experience even if it is not in the conscious mind of the individual (Perry 2008, 2009; Rothschild 2000; van der Kolk 2015).

2.3. Arousal States and Needs in the Brain

Prior to determining how to best approach and address social, emotional, or behavioral symptoms of a child or adolescent, it is important to first discuss the arousal states and "needs" of the distinct brain regions. According to the *Conscious Discipline Brain State Model* (a model informed by Perry), the brain has three hierarchical needs, which correspond to three distinct brain regions and states of arousal: *safety* (brainstem-survival state), *connection* (limbic system- emotional state), and *problem solving* (prefrontal lobes-executive state). A child who is disruptive or aggressive (survival state) needs to feel safe and regulated. A child who is emotionally dysregulated (emotional state) needs to feel loved and connected. When a child feels safe and loved, they will in turn have greater freedom and capacity to solve problems, understand and reflect upon their experiences, and make meaning or learn from experiences. This executive state of functioning, which takes place in the cortex or prefrontal lobes, is ideal for growth and learning (Brain State Model n.d.).

When taking in information from the environment, a child typically responds to the event (e.g., physiology, behaviors, emotions) before they have a chance to reflect (e.g., thoughts) on it. As such, a dysregulated child is unable to connect to, or reason with, another person. Not until a child feels safe (e.g., sensory regulation) and loved (e.g., emotional regulation) can they respond to logic and critically reflect upon experiences in their environment. This is important to note not only for clinicians, but also for any individuals who work with children/adolescents (or adults for that matter) as it is common for adults to interpret the reactions and behavior of a traumatized child as the result of a conscious choice or decision.

2.4. Developmentally Appropriate, Brain-Based Interventions

Perry (2008) offers insightful guidance with regard to the implementation of developmentally appropriate interventions, which he calls *The Six R's of Healing Trauma*. He believes that interventions should be relational, relevant, repetitive, rewarding, rhythmic, and respectful. A *relational* intervention involves engaging and interacting with the child in a safe manner, which fosters trust and attachment with the child. A *relevant* intervention targets the region of the brain that is disrupted, starting with the lowest disorganized region. In other words, if a child is in a state of dysregulation, we need to help him calm down and feel safe (e.g., sensory regulation) before trying to connect to or reason with him. A *repetitive* intervention involves a patterned, routine response that occurs over and over again, which serves to help the brain make healthy neural connections and helps the child develop a sense of predictability and expectation (e.g., safety). The lower the dysregulation in the brain, the more repetitions needed to enhance regulation. A *rewarding* intervention involves fun, playful activities, which serve to soothe brainstem dysregulation and help the child feel relaxed and calm. A *rhythmic* intervention resonates with neural patterns in the brain and involves simple, recurring activities to help a child soothe and connect to other individuals. A *respectful* intervention is sensitive to child, family, and cultural considerations, ensuring that the child feels understood and appreciated, which fosters mutual respect and trust.

In order to most effectively help a child manage a perceived threat from the environment, it is important to assess specifically which areas of the brain are triggered and/or experiencing a deficit in functioning (Perry 2009). Observing various symptoms and behaviors exhibited by a child or adolescent can often provide helpful insights into which areas of the brain might be dysregulated (van der Kolk 2015). For example, disruptions in the brainstem are often associated with physiological concerns (e.g., difficulty breathing) or sensory integration difficulties (Neigh et al. 2009; Perry 2006; van der Kolk 2015). Difficulties with sensory integration include children who are over-sensitive (e.g., a child who is overwhelmed or has an extreme reaction to a loud noise or the touch of another person) or under-sensitive (e.g., a child who is hyperactive, excessively clumsy, or invades personal space) to events or objects. Children experiencing brainstem disturbances need to be soothed with repeated sensory stimulation, calming music or simple movement activities, or sensory-based relaxation exercises (e.g., rocking, drawing, or stretching; Perry 2006, 2008, 2009; Gaskill and Perry 2014). Diencephalic dysregulation is associated with sleep disturbances, changes in appetite, or disruptions in arousal (e.g., level of awareness or activity). In addition to continued brainstem activities, these children are best regulated through physical activities (e.g., push-pull activities; roll, throw, and catch games; running) and combined music and movement activities (Perry 2006, 2009; Gaskill and Perry 2014). Children experiencing disruption in the limbic system, in turn, often have difficulty regulating their emotions and exhibit attachment difficulties. Activities that are relational, nurturing, and experiential in nature (e.g., pretend play) may be particularly beneficial to this group (Perry 2006, 2009; Siegel 2012; Siegel and Bryson 2012). In addition, activities that allow for safe expression of emotions (e.g., arts, crafts, and dance) can also be helpful (Hughes and Baylin 2012; Malchiodi 2014; Perry 2006, 2009). As previously noted, the cortex is not fully developed until early adulthood. However, some children or adolescents nonetheless encounter significant difficulties in their cortical development, resulting in poor impulse control, impaired judgment, and deficits in cognitive performance. These difficulties can be further exacerbated by disruptions in lower brain regions. However, if and when the lower parts of the brain have been regulated, educational experiences and talk-based therapies (e.g., insight-oriented and cognitive-behavioral therapy) can be utilized to target the cortex (Perry 2006, 2009).

2.5. Case Study: Rebecca

Rebecca is a six-year-old girl. Her biological mother brought her into treatment because she was exhibiting anger outbursts, aggressive behaviors, impulsivity, and attach-

ment concerns (e.g., avoidant of mother; hugs strangers). Upon further assessment, the therapist gathered that Rebecca was exposed to drugs in utero and experienced parental neglect for the first 2 years of her life as both mother and father were frequently using drugs. Further, Rebecca was often exposed to domestic violence between her parents during this time as well. Rebecca and her mother moved to another state when she was 2 years old, and her mother has been clean and sober ever since.

Based on this information gathered, it is reasonable to suggest that Rebecca suffered significant disruption to her lower brain areas (e.g., brainstem, diencephalon) because of several traumas experienced from 0–2 years of age. It is also plausible to assume that this lower brain dysfunction has in turn adversely influenced the growth of the higher regions (i.e., limbic system, cortex), resulting in behavioral and emotional dysregulation. Many of the traumatic events Rebecca experienced occurred before she had verbal abilities or conscious awareness. As such, many of her trauma memories were stored in her body and expressed in her behaviors rather than through words. Even though her mother has been much more present and engaged with Rebecca in recent years, Rebecca continues to feel unsafe and unloved, and has been largely unresponsive to discipline. To this end, the first goal of the therapist, before anything else can be done, is to create an environment of safety for Rebecca.

During her first session, Rebecca spat in the therapist's face and hid under a chair. Even though the therapist engaged her with a smile and got down on their knees to greet her from a safe distance, she perceived the therapist as a threat and her body (e.g., brainstem/diencephalon) flipped into survival mode and reacted in a habitual manner to ensure safety (e.g., attack/hide). Upon entering the playroom, she knocked all the toys off the shelves and subsequently sat in the middle of the room, screaming for several seconds. This behavior is a clear indicator of behavioral and emotional dysregulation, which suggests impairment in the lower brain areas and the limbic system. She also picked up one of the toys and threw it at the therapist. As the therapist reflected her feelings, she told the therapist to shut up. At this point, Rebecca is still responding in a manner consistent with brainstem dysregulation and she is unable and unwilling to receive soothing through words. She hides under a desk and starts barking (e.g., primal, survival response). At this point in the session, rather than talking with her, the therapist, working under an NMT framework, begins humming a soft and simple melody (e.g., simple, rhythmic music) and hands her a blanket (e.g., sensory comfort). After a few minutes, she crawled out from under the desk and began playing with some of the toys on the ground by herself. Rebecca is beginning to feel safe with the therapist in the playroom, but they have not yet relationally connected. Her play remains rather violent in nature (i.e., throwing various toys). In order to further cultivate relational safety, the therapist sets a therapeutic limit by reflecting her feelings ("I know you are upset . . ."), communicating the limit (" . . . but people are not for hurting."), and offering a safe alternative ("If you *need* to throw something, you can throw these cotton balls."). Therapeutic limits help create an environment that is predictable and safe for a child. Sensing that Rebecca's body is still in an aroused and triggered state, it is important to not restrict the body's *need* to engage in the proprioceptive activity of throwing, which might be regulating for her. As such, the cotton balls help her satisfy this need in a manner that is safe and regulating (e.g., soothing both the brainstem and diencephalon). Rebecca enjoys throwing cotton balls at the therapist and laughs as she engages in this activity for several minutes. At this point, Rebecca is feeling safe and connected with the therapist. As such, she was now ready to engage in the therapeutic process in a manner that was playful and engaging.

Over the next few sessions, the therapist engaged Rebecca in experiential play therapy activities that allowed her to freely and safely express her thoughts, feelings, and behaviors. At the beginning and end of each session, sensory-based (e.g., proprioceptive/movement activity) and rhythmic activities (e.g., played relaxing music) were integrated into the therapeutic process to further soothe brainstem/diencephalic dysregulation and to foster healthy neural connections between those areas. After several months of treatment (once

Rebecca was consistently regulated), the mother was invited into the therapeutic space and therapy was then leveraged to help foster the attachment between the two of them, utilizing many of the same activities previously discussed. Prior to this, the therapist met with Rebecca's mother each week to help her understand Rebecca's behavior, teach her how to engage in soothing/engaging activities, and have her routinely practice them at home with Rebecca several times per week. Rebecca's disruptive behaviors significantly decreased over the course of treatment, and her attachment/relationship with her mother improved considerably.

3. Parenting with the Brain in Mind

Interpersonal neurobiology (IPNB) is a theory and practical working model that aims to explain the interaction among the brain, mind, and relationships with others (Siegel 2012). IPNB posits that the mind is heavily influenced by relationships and we are to a large degree a product of our relationships. All relationships alter the brain to some extent, especially the most intimate ones (e.g., parents, partners), and our brains are constantly being reshaped and rewired by new relationships (Siegel 2012). Positive neurological connections lead to brain integration, clearer thoughts, and improved relationships (Siegel 2012). As neural processes are shaped by social relationships throughout one's lifetime, IPNB has been researched and is posited to be beneficial for work with children and adults alike (Siegel 2012). However, the focus of this paper is on childhood, and more specifically childhood trauma. IPNB has important implications for healing trauma. Positive relationships create positive changes, which produces healing for those who have suffered from trauma. With this in mind, parents and caregivers have a significant opportunity to help their children integrate aspects of their brain enabling them to thrive personally and interpersonally, as well as manage adverse experiences in childhood.

Daniel Siegel has written several books to help parents better understand and connect with their children in order to better respond to disruptive and emotionally charged behaviors, including: *The Whole Brain Child* (Siegel and Bryson 2012), *Brainstorm* (Siegel 2015), and *No-Drama Discipline* (Siegel and Bryson 2016), just to name a few. In each of these books, he provides a neurobiological understanding of childhood or adolescent behavior and how this can and should inform how we address their behaviors in order to help them achieve a greater sense of wellbeing. Although these books are not specific to parenting a child with traumatic stress, the information he shares is certainly applicable to navigating associated behaviors with this population in a manner that is informed by a neurodevelopmental understanding of childhood behaviors. His understanding of brain development bears considerable resemblance to that of Bruce Perry, discussed previously.

The Integration of the Brain and Social Relationships

The brain is a fascinating organ. Like many things in life, the brain functions best when the various sections are balanced and organized well, working in unison to accomplish tasks. This is what Siegel calls integration, which he believes is the key to health and success in life, and contributes largely to the wellbeing of an individual (Siegel and Bryson 2012). A brain that is more fully integrated has a variety of benefits for children, including improvements in executive functioning, emotional and behavioral regulation, personal insight, social relationships, and academic achievement (Siegel and Bryson 2012).

In *The Whole-Brain Child* (Siegel and Bryson 2012), Siegel and Bryson discuss several strategies to help parents address challenging childhood behaviors in a manner that is sensitive to brain development and fosters connection. Prior to determining how to balance or integrate the brain, it is important to understand some of the differences between various sections of the brain. Similar to Bruce Perry, Siegel and Bryson (2012) point out that the lower parts of the brain (brainstem, limbic system) develop quicker than the higher parts (cortex). Under stressful or emotionally overwhelming situations, the lower parts of the brain tend to take over and often result in emotional or behavioral dysregulation and poor decision making (Siegel and Bryson 2012). Further, the right side and left side of the

brain have different functions; whereas the left side is more analytical (e.g., verbal, logical), the right side is more emotional (e.g., nonverbal, creative). The right brain is also more connected to the lower brain areas. To this end, it is important to understand that most children do not yet possess a fully developed capacity for logic and are more prone to solve problems in the face of adversity with emotions rather than reason (Siegel and Bryson 2012). As such, rather than punishing a child who is overwhelmed with their emotions, it is more productive and beneficial to connect with them and help them regulate their emotions.

Punishment is often reactive to a child's misbehavior and forces the child to do something, which does not foster internal motivation. Instead, Siegel and Bryson (2012, 2016) advocate discipline that is proactive and teaches the child how to do something. In order to appropriately address disruptive behaviors or dysregulated emotions, it is important to try to understand why the child is reacting in that manner and determine how they can teach them how to more effectively engage in behaviors and express emotions that are more beneficial and soothing for the brain. This initially involves listening to the child, validating their feelings, and communicating comfort through reflection of their feelings (Siegel and Bryson 2016). Children are not born knowing how to regulate their feelings on their own and often struggle in their efforts to determine how to do so. They need someone to help them or teach them how to calm down. Under high stress situations, many children have difficulty not just controlling their emotions, but controlling their bodies. To this end, it can sometimes be helpful to engage a child in some type of movement activity (e.g., walking, running, dancing, stretching, squeezing, etc.), which helps them to regain balance both in their body and in their brain (Siegel and Bryson 2012). Once calm, children are more able to talk about their experiences and better understand the consequences of their behaviors, and discipline (if appropriate) can ensue. It is important to understand that even when a child is calm, long lectures and lengthy speeches are not helpful and often increase stress. It is more helpful to validate a child's feelings (rather than ignore or dismiss them), encourage them to talk about what is bothering them (if willing and at their own pace), and help them determine how to solve their problems (rather than avoiding the problem or solving it for them; Siegel and Bryson 2012). This will help a child feel more in control of their emotions, behaviors, and situation, as well as make meaning of their experiences. Ultimately, this leads to greater integration in the brain by allowing a child to engage all aspects in a healthy manner (Siegel and Bryson 2012).

As alluded to earlier, the brain is a social organ and is constantly being shaped and reshaped by interpersonal interactions (Siegel 2012). It is important to help children not only understand the impact of their behaviors on their own functioning (personal insight), but also how their behaviors have or might impact others (empathy). These are core components of interpersonal integration (Siegel and Bryson 2012). Once a child is calm and feels understood by and connected to the parent, it is often helpful to help children think about others that may have been impacted by their emotions or behaviors (e.g., perspective-taking) and repair relationships that may have been damaged or disrupted (e.g., asking forgiveness; Siegel and Bryson 2012). This can be accomplished by asking a child how they think another person may have felt when the child yelled at or hit them, and subsequently asking the child what they think they can do to help the other person feel better or know they are sorry. It is important to note that this should never be forced upon a child, but rather discussed and offered to the child as a way to foster relationship, helping them understand the relational benefits of taking responsibility for our behaviors and apologizing for mistakes made (Siegel and Bryson 2012). The goal is not to evoke subjective guilt or shame in the child, but instead to foster love and support for others. Another way to help children develop a greater sense of connection and attachment with others is to engage in fun, playful activities throughout the week with each other. Engaging in these types of interactions over and over again teaches children that healthy relationships are joyous, and categorizes relationships as rewarding in the brain (via the release of dopamine; Siegel and Bryson 2012).

4. Thinking about the Sacred in Child Traumatic Stress

A neurodevelopmental or neurobiological approach to child traumatic stress tends to view brain development and the impact of trauma on the brain from an evolutionary perspective. That is, through the process of evolution, our brains have been wired and adapted over time to respond to threats in the environment (e.g., fight, flight, or freeze), and this response is largely impacted by social relationships, both past and present (Siegel 2012). This perspective largely does not address the notion or possibility that our bodies (and brains) exist and function alongside the sacred and transcendent. While these models would likely be amenable to, or at least accepting of sacred or spiritual influences, they are not considered to be central to human deficit or flourishing. However, because many families with childhood histories of trauma are highly religious, or spiritual, bringing these influences to the forefront and integrating them with the course of treatment may help them more readily accept the reality and better understand the impact of the trauma experience, rather than avoid or ignore the associated thoughts, feelings, and behaviors.

Many families seek therapy for themselves (or their children) from a therapist with a like-minded faith background (Harris et al. 2016). While they typically understand that psychotherapy is distinct from pastoral or religious counseling, they often feel more at ease when they know their therapist's (or child's therapist's) beliefs are compatible with their own and/or when their beliefs are acknowledged and incorporated into the course of therapy (Captari et al. 2018). It is important to note, however, that parents who seek mental health services from a psychologist do not expect them to explicitly recite scripture or pray with them or their child (we are not advocating this nor do we believe it is necessary to integrate the sacred into the counseling process). Notably, how one views religion or God in the face of trauma or stress can profoundly impact their overall wellbeing (Ano and Vasconcelles 2005). Furthermore, trauma has the potential to negatively impact not only one's emotional wellbeing, but also their spiritual wellbeing (Wang et al. 2016). For example, research has shown that maintaining a positive image of God (e.g., benevolent) is related to greater psychological wellbeing, while maintaining a negative God-image (e.g., punitive) is associated with greater psychological distress (Silton et al. 2014). Moreover, it is also important to note that the emotional and spiritual impact of trauma may apply not only to the trauma survivor, but also to the family members and friends who bear witness to this trauma (Wang et al. 2014). Accordingly, what we would like to do for the rest of this paper is to offer a few considerations on how the sacred might be integrated into an NMT-informed approach to treating childhood trauma.

4.1. Religious Coping in Children and Adolescents

Religion has been shown to be beneficial to the overall development of children, particularly with regard to psychological adjustment and social competence (Bartkowski et al. 2008). However, the benefits may diminish or lead to poorer developmental outcomes in a child when the parents practice a different faith, one parent does not believe religion is important, and/or parents argue about their religious practices. Further, internalized behavior problems were more common when the parents were overly strict or punitive in their religious practices (Petts 2011).

Religion and spirituality can also play an important role in helping children of all ages and their parents effectively manage difficult thoughts and feelings brought about through significant stressors and trauma experiences. As a child matures, the understanding and expression of their faith grows according to their developmental progression, evolving from a more concrete understanding and expression of faith to a more complex and symbolic comprehension and expression of this faith. The formation of faith for an infant child is largely implicit and relies heavily upon the attachment with the primary caregiver. Although not final and complete, this forms the foundation of faith development and coping moving forward throughout a person's lifetime (Fowler and Dell 2006).

Many people seek religion and spirituality, or cling tighter to it, in order to make sense of their trauma, grow closer to God and others as a source of comfort and support, or make

a positive change in how they live (Walker et al. 2010). To this end, they may positively reframe their experiences, engage in more frequent and thoughtful prayer, seek support from peers at church, and make transformative life changes. Engaging in such positive religious coping strategies has been shown to lead to improved psychological adjustment, including increased happiness in the present, improved optimism about the future, and a greater sense of purpose in life (Ano and Vasconcelles 2005; Pargament et al. 2001).

However, significant stressors and adverse experiences can also create and exacerbate trauma symptoms and negatively impact one's spiritual wellbeing (Ano and Vasconcelles 2005; Van Dyke et al. 2009). In turn, these experiences may lead a child or parent to move further away and distance themselves from God (Walker et al. 2009). They may be angry with God for not interceding, doubt the omnipotence of God, or feel like God is punishing them for some reason (Pargament et al. 2001). To this end, they may stop praying and attending church, or stop believing in God altogether, adopting a philosophy that the world is dangerous and evil and God cannot or will not protect or comfort them. Research has shown that negative religious coping, such as those described above, can lead to higher levels of anxiety and depression (Ano and Vasconcelles 2005; Van Dyke et al. 2009). As such, it is essential that clinicians not only understand the potential role religious coping can play in the lives of religious children and their parents, but also know how to effectively work with children and parents to foster adaptive coping and resilience within the context of their faith background.

4.2. Integrating the Sacred into the Neurobiological Model

As noted earlier, one of the core tenets of a neurobiological understanding of brain development is that the brain is organized and should be responded to in a hierarchical manner from the bottom-up: *safety* (brainstem-survival state), *connection* (limbic system-emotional state), and *problem solving* (prefrontal lobes- executive state). To this end, in order to help a person in an acute state of distress, we need to first help them *regulate* their behaviors, then *relate* to us or others, and then *reflect* upon or make meaning of their experience. In other words, in order to heal from trauma, we first need to trust the people around us to keep us safe. Once we feel safe, we can now grow in relationship to others. Additionally, as we feel safe and grow in our relationship with others, we can better understand and know ourselves and others in relationship (i.e., make meaning of the things that happen in life). We contend that not only does this guide how we relate to other human beings and find healing in times of stress, but this is also how we do the same in our relationship with God. How we respond to stress and the impact this has on our relationship to God keenly influences our ability to cope, and ultimately our ability to heal. This is true for both children and adults.

After a traumatic experience, or the exposure to a trigger that brings one back to a previous traumatic experience, a child may feel dysregulated and their physiology may be adversely aroused (e.g., difficulty breathing; racing heart). In this moment, a child feels unsafe and scared, and the world around them appears dangerous. They need someone to help them soothe and calm down. It is essential for them in this moment to have someone help them regulate their behaviors. We also suggest that it would be important for their spiritual wellbeing and resilience to also engage their view of God as a source of comfort and security. If their behaviors are regulated (and they view God as comforting and loving), they have the capacity for deeper connection and relationship with others (and God). If not, they will not only feel abandoned and unloved by others, but by God as well (in fact, the two can often be self-reinforcing). This is consistent with what is referred to in parental attachment literature as the *correspondence hypothesis*; that is, one's attachment to a parent is often generalized to other interpersonal relationships, including spiritual or religious (Granqvist and Kirkpatrick 2013; Hall et al. 2009). Subsequently, the more they feel safe and loved by others (and God), the more they can make meaning of difficult life experiences and positively reframe stressors so as to stay in connection to others and God. If they continue to feel unsafe and unloved by others and God, they will have more difficulty

making meaning of their experiences or turn away from others and God for help. One of the most important protective factors in coping with trauma is support from others (Cicchetti 2013), and if a person not only feels unsupported by others, but actively pushes them away, the more detrimental the impact of the trauma experiences (Turner and Butler 2003). This is why it is essential to help children feel safe and connected to others, and help their parents foster an environment that promotes security and connection. Although we present this therapeutic approach as suitable and beneficial for children of all ages who have experienced trauma, it is important to note that interventions or interactions should never be forced upon a child or into a therapeutic relationship. The age and development of the child and the timing and relevance of specific interventions should always be taken into account.

4.3. Integrative Therapeutic Strategies for Therapists and Caregivers

As previously stated, from a neurodevelopmental perspective, it is essential to help a child and a parent feel safe after exposure to a traumatic event or a trigger to a previous event. The brainstem needs to be regulated and the person (child or parent) needs to feel comforted. This is largely accomplished, not through words, but through sensorimotor activities (e.g., calming music, relaxation/grounding exercises, increasing positive sensory experiences, or repetitive simple movement activities). For children who are soothed by calming music, one way to integrate the sacred into this process is by playing or softly singing worship songs at home or in session. This will not only help them regulate, but will also remind them of God's love and presence. Slow breathing exercises can also integrate the sacred into the experience (e.g., breathing in God's love/presence; breathing out the pain/hurt). There are certainly times when helping a child soothe in the moment of dysregulation is necessary to ensure their safety, but it is often very helpful to frequently practice these techniques and exercises when the child is calm. This will make it easier for them to engage in the exercises when stressors increase. In other words, in moments of crisis or dysregulation, the child will not be able to think about the intervention. Rather, we help them engage in the intervention through modeling and co-regulation. It is important to remember that these interventions and exercises should never be forced upon the child. If a child rejects the intervention, we change course. After all, the overall goal is regulation and soothing, and helping a child feel comforted in and of itself is an indirect integration of God's comfort through the medium of others. Over time and through multiple trials, it often gets easier to determine for therapists and caregivers the activities, exercises, and interventions that are most beneficial in this process. Once that is determined, the therapist or caregiver can begin to integrate the sacred into the experience.

Once a child feels safe and regulated, the subsequent goal is to help them feel loved by and connected to another. When the limbic system is dysregulated, the child's feelings and attachment capacities are disrupted. Activities that help in this manner are those that are relational and nurturing, and allow for a safe expression of emotions. While it is certainly important that a child feel connected to the therapist, it is also important that that child feel connected to and nurtured by their caregiver with whom they spend most of their time. As such, many of the activities in this realm should be taught and practiced in session and at home. One way to integrate the sacred into this realm for a child who is questioning God's love or is angry with God, is to allow them to share that anger in a healthy and safe manner. It is helpful to engage in these activities in an experiential manner at this stage. To this end, the therapist can have the child pick a cotton ball for each question or anger expression they have toward God. Subsequently, the therapist can have them throw the cotton ball at the wall while speaking or yelling out the question or anger expression. The therapist then validates and asks the child if they would like to talk about any of their questions or anger expressions further. It is important to note that cathartic aggressive activity without subsequent comforting, processing or problem-solving can sometimes lead to continued or exacerbated anger or aggression (Schaefer and Mattei 2005). As such, it would be helpful to have a subsequent conversation about what would help them feel more

connected to or less angry with God. However, keep in mind that the goal at this stage is safe expression of feelings and building relationship. Some children may not be ready or able to engage in this type of processing at this stage. Even so, if you are working with a child with significant anger outbursts or aggressive behaviors, it may be more beneficial and efficacious to engage the child in a cathartic art, music, or play-oriented activity, as a safe alternative to expression of anger. When the child starts to feel more connected to a concrete person (e.g., therapist, caregiver), they will have a greater capacity to feel connected to a seemingly abstract God (Granqvist and Kirkpatrick 2013). As such, many of the activities for a child who is experiencing limbic system dysregulation are relational and nurturing. Activities and exercises that infuse positive touch experiences are often helpful in this realm (e.g., hand-holding; hugs; gentle massage). As you can imagine, the caregiver is largely involved in engagement with the child during these activities, while the therapist teaches and directs them in the interactions. The therapist can help the caregiver understand the integrative aspects of positive touch experiences in building attachment to others (e.g., God is a relational being), which allows for a greater capacity for the child to feel comforted and loved by God (Hall et al. 2009). Another exercise that is integrative and may prove beneficial in helping the child feel more connected to God is having the caregiver engage in prayer with their child, allowing the child to safely share their feelings with God without judgement or condemnation. These prayers can allow for safe expression of negative feelings as well as reminders of God's presence and love even in the darkest of times.

Once the child feels safe and loved, they are then capable to further reflect on their experiences and start to make meaning or reframe those experiences in a manner that is productive and beneficial. While experiential exercises may still be helpful at this stage, the child is more able to have conversations and better understand multiple nuances of their plight. It is possible in this realm to help them build insight and understand the impact of their thoughts, feelings and behaviors on their overall wellbeing. One way to integrate the sacred into this realm is to teach them the interactive model (e.g., interaction between thoughts, feelings, behaviors, and physiological experiences), helping them understand the impact of each of these on how we think, feel, and behave. Not only can this help them reframe or balance inaccurate or unhelpful thoughts about their traumatic experiences, but it can also help them do so in their outlook on God and the perceived role the sacred has played in those experiences. This may also encourage them to engage with peers at church (if they stopped attending) and lessen the intensity of their difficult feelings. Thought records may also prove beneficial in helping a child find evidence for or against a particular negative belief they hold about God after having gone through a traumatic experience. Again, it is important to note that this is never forced as an intervention, but if brought forth by the child or seems to be a stumbling block for the child, it might be helpful to explore the sacred further. This same activity can be done with the parent to help them reframe or make meaning of traumatic experiences. Religious families often want to quickly use logic and make rational arguments in order to facilitate meaning-making. While there is certainly a time and place for this type of processing, the NMT model helps us understand why we need to initially start with lower-brain (brainstem, limbic) interventions, and then gradually move toward logic and reasoning when the child is able to be more receptive and reflective.

5. Conclusions

Childhood trauma is pervasive and can have devastating effects on the physical, emotional, and social wellbeing of the child. It is important as clinicians and caregivers that we not forget the potential spiritual impact of these experiences as well. Religious beliefs and sacred practices can profoundly impact how one understands and manages trauma experiences and symptoms. Holistic healing from trauma incorporates the sacred into the intervention process. Every child experiences and manages stress and trauma in a unique manner. As such, the concepts shared and interventions noted in this paper will

not apply to every child. Even so, the information shared in this paper will add to the existing literature and hopefully encourage further exploration in the interaction between childhood traumatic stress and the sacred.

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