

Integrating Interpersonal Neurobiology With Play Therapy

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Advancements in neuroscience support play and empathic attunement as contributors to brain development and formation. As such, a natural connection seems to exist between play therapy and current neuroscience concepts. This article assimilated theories from the interpersonal neurobiology model (Siegel, 2012), including the 9 levels of integration, with play therapy processes and practices. Identification of complementary components may bolster efforts to advocate for the play therapy field as well as inform intentional intervention by practitioners.

Keywords: play therapy, interpersonal neurobiology

Neuroscience research continues to generate knowledge of the processes and structures of the brain. Application of this knowledge may be relevant to counseling and therapy (Ivey & Zalaquett, 2011; Gonçalves & Perrone-McGovern, 2014; Montes, 2013). In fact, according to the latest Delphi poll, the influence of neuroscience on the counseling profession is predicted to increase over time (Norcross, Pfund, & Prochaska, 2013). Preliminary investigations have demonstrated counseling effectiveness for interventions that promote positive brain plasticity and neural growth (Gonçalves & Perrone-McGovern, 2014). Although the capacity for neuroplasticity continues across the life span, brain development occurs at astounding rates during early childhood (e.g., ages 0–6) laying the foundation for neural pathways and related future functioning (National Scientific Council on the Developing Child, 2010; Siegel, 2012). Additionally, advancements in neuroscience support the importance of play, as well as social relationships, to healthy brain development (Badenoch & Kestly, 2015; Siegel, 2012).

Play and positive relational experiences influence anatomy, supporting the notion that early recognition of neural disintegration and

interventions with young children such as play therapy may prove essential. This article sought to provide practitioners theoretical connections between emerging findings in neuroscience and play therapy intervention using the interpersonal neurobiology (IPNB) model. Intervention and education within the IPNB model addresses nine domains of neural integration that contribute to functioning and relationships (Siegel, 2012). Knowledge of the neurological processes that support play therapy may contribute to increased therapeutic presence by the practitioner, intentional intervention aimed at one of the nine levels of integration, as well as capacity to advocate and explain the power of play in the counseling room (Badenoch & Kestly, 2015). Even so, the emphasis on neurobiological components of therapeutic intervention included in this review should not be interpreted to suggest a reductionistic approach; instead, practitioners are encouraged to intentionally integrate these findings with prior knowledge of play therapy, the therapeutic relationship, and a holistic view of each unique child who enters the playroom.

Foundation of Interpersonal Neurobiology

IPNB synthesizes principles and findings from different scientific disciplines to explain the interconnection among the brain, mind, and relationships with others (Siegel, 2012). The IPNB model illustrates that energy and information flow between these three areas within an individual and between the nervous systems of others in the social environment. These systems seek continuous self-organization toward

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greater levels of integration among brain, mind, and in interactions. As a result, integration contributes to health, growth, and restoration. Several theories from neuroscience, integrated within IPNB, add support to the power of play and the play therapy process, including (a) encoding of implicit and explicit memory (Siegel, 2012), (b) the polyvagal theory (Porges, 2011), (c) neuroplasticity (Kandel, 1998), and (d) the affective emotional–motivational systems of the midbrain (Panksepp & Biven, 2012). Basic summaries for these neuroscience theories will be provided to allow for conceptual inclusion of neuroscience with play therapy. However, this review is not exhaustive, nor a replacement for review of the original scholarly works (see Kandel, 1998; Panksepp & Biven, 2012; Porges, 2011; Siegel, 2012, for a detailed explanation of theories above).

Implicit memory forms prenatally; and once born, the caregiver attachment can “shape the growing child’s architecture of the self” (Siegel, 2012, p. 55). Implicit memory is unconsciously recalled from mental models of behavior, images, and emotions that guide anticipatory planning and reactions. Conversely, explicit memory, appearing around age 2 years, is consciously encoded by the individual with focused attention, and adds a sense of time to an autobiographical recollection. Children learn and attach meaning through remembering and retelling of an experience whereby “our relationships not only shape what we remember, but how we remember and the very sense of self that remembers” (Siegel, 2012, p. 59).

Polyvagal theory (Porges, 2011) asserts there are three neural systems in human beings, which continuously assess and match response to a sensory experience or environment. The most primitive of these responses is “immobilization” or feigning death for survival. Second, the “fight-or-flight” response, allows us to mobilize and engage or flee a perceived threat. Finally, social behavior, communication, and homeostasis are achieved once the sympathetic nervous system (SNS) has been calmed and higher order neural processes are engaged. In therapy, this allows for development of safety and trust in the therapeutic relationship. All three systems seek a safe environment and respond from more developed circuits first (i.e., social engagement). However, if developed cir-

cuitry fails to establish safety, older circuits are engaged sequentially.

Neuroplasticity refers to the development of new connections within the brain derived from exposure to new experiences and stimuli (Kandel, 1998). The brain’s amazing potential for stimulation of growth across the life span, supported through the concept of neuroplasticity, allows for reparative experiences that can enhance neural development. Neuroplasticity offers hope for change versus prior beliefs that our early experience condemned an individual to a certain level of functioning or behavior.

Basic emotional networks in the brain respond in an instinctual manner within the primitive sections of the brain (Panksepp, 2010). They also contribute to achievement of survival needs. These primitive networks inform higher order psychological processes and motivate behavior. To date, seven basic emotional processes have been identified in mammalian subjects including *seeking, rage, fear, lust* (seen in adolescence), *care, grief, and play*.

Badenoch and Kestly (2015) have asserted that emerging principles of IPNB support play therapy “as an optimal means for children to find their way back to a healthy developmental path” (p. 525). Yet, research examining practical applications of neuroscience in play therapy is still in its infancy. Play therapy is rooted in the premise that play is the natural, first language of young children to communicate their needs, emotions, and thoughts to significant adults in their lives (Landreth, 2012). Therefore, understanding the importance of natural play and its impact on child development is crucial prior to delving into the play therapy process as it relates to IPNB.

Play and the Play Therapy Process

Natural, unsolicited play is critical to a child’s holistic development, which encompasses cognitive, socioemotional, neurobiological, and physical aspects (Berk, 2012; Erickson, 1963; Greenspan, 1993; Ray, 2011). Play creates opportunities for children to develop social skills, self-regulation, and a responsive nervous system to life. Through these opportunities, children are better able to make sense of life events, their environment, and important relationships. Play contributes to cognitive and social development, and when traumatic experi-

ences disrupt this development progression, children can demonstrate heightened stress responses, immobilization, and developmental delays (Badenoch, 2008). Kestly (2015) has described play as the “glue” for developing secure relationships. Within the safety net of a secure relationship, the child is then free to learn, grow, and respond to his or her environment. Thus, play is considered to be the foundational element of social connection.

Play Therapy

Play therapy, a developmentally responsive and empirically supported approach to counseling children, uses the child’s natural language of play (Bratton, Ray, Rhine, & Jones, 2005; Landreth, 2012; Lin & Bratton, 2015; Kottman & Meany-Walen, in press; Ray, 2011). Because play is critical to children’s overall development, play therapists agree that use of play and symbols as a natural means to express themselves best supports the needs of the child in therapy (Landreth, 2012; Ray, 2011). Research supports a long history of play therapy as an intervention for different presenting issues: (a) externalizing or disruptive behaviors (i.e., aggression, attention-deficit/hyperactivity disorder symptoms, anger, and impulsivity; Flahive & Ray, 2007; Garza & Bratton, 2005; Ojiambo & Bratton, 2014; Packman & Bratton, 2003; Ray, Blanco, Sullivan, & Holliman, 2009; Ray, Schottelkorb, & Tsai, 2007), (b) academically at-risk (Blanco & Ray, 2011; Blanco, Ray, & Holliman, 2012), and (c) functional impairment (Ray, Stulmaker, Lee, & Silverman, 2013). In 2005, a meta-analysis revealed a large effect size to support the view that play therapy is an efficacious intervention to reduce problem behaviors (Bratton et al., 2005). A recent meta-analysis, conducted with more stringent methodology, also revealed a medium effect size for child-centered play therapy as an efficacious intervention (Lin & Bratton, 2015) for children exhibiting disruptive behaviors.

Current research on play therapy has focused on behavioral outcomes, not neurobiological components. However, recent neurobiological research has theoretically supported this modality (e.g., play therapy) for counseling children as an effective intervention based on the development level of the child. Children’s *play* and *seeking* circuits are consistently online; thus, an

invitation to play is not needed and this modality naturally allows children to engage in the therapeutic process with more ease than older individuals (Kestly, 2014). Here, we tie in the foundational elements of IPNB as mentioned previously to the play therapy process.

Implicit and explicit memory. According to Marks-Tarlow (2012), “play is a major source for implicit learning within the social domain” (p. 89). Within the play therapy process, children are given that opportunity for implicit learning. Restoration or reconsolidation of preverbal implicit memories emerge through their natural process of play (Kestly, 2014). Through the safety of the therapeutic relationship, children engage in the right–left–right progression of integration (McGilchrist, 2009). Children begin integrating their memories into their autobiographical story by bringing their implicit memories to the explicit, conscious world. Children engage in metaphorical play that emerges naturally in the play therapy process, thus grounding this experience in nonverbal storytelling. As therapists witness this experience and reflect on the child’s process, the child begins to find language to express his or her experiences. Due to the verbal communication of the child’s process, the metaphoric and verbal worlds connect, thus increasing auto-graphical and metaphorical understanding of his or her embodied story (Kestly, 2014; McGilchrist, 2009). This process takes place naturally and repeatedly in play therapy as the therapist stays attuned to the child’s needs and experiences.

Polyvagal theory. Porges (2011) outlined three neural systems that every human being experiences. However, for the play therapy process to occur, the child’s SNS must enter a calm state, indicating to the child’s mind that the environment is safe to explore and engage. Kestly (2014) emphasized the importance of a “play sanctuary,” in which the environment is designed to create a calm, safe space that is inviting and welcoming of the child. Although termed differently, play therapists have spoken of the importance of playroom stability and predictability for decades (Axline, 1964; Landreth, 2012; Ray, 2011). To create a play sanctuary, Kestly (2014) outlined several considerations for therapists: (a) Invitational aspect of the play space: Is it inviting?; (b) Organization and predictability: Will the child know what to

expect week to week?; (c) Special play areas: Does the play space include nurturing, aggressive, make-believe, reality, and creative toys?; and (d) Flexible boundaries: Are the boundaries presented to create safety as well as flexibility? Although the therapist can create a space that offers safety, the child must *perceive* the environment as such in order to calm his or her SNS to engage in the circuitry of *play* (Panksepp & Biven, 2012). As the play circuit is engaged and safety is felt, children are capable of accessing their implicit memories and bringing those to the forefront of their play to begin integration into their autobiographical story (Kestly, 2014).

Neuroplasticity. Through new, repetitive experiences, all individuals are capable of altering their neural nets to create new experiences, thoughts, behaviors, and feelings regarding previous memories/beliefs (Kandel, 1998; Siegel, 2012). Through engagement in play therapy, children can experience new, safe relationships that counter previous beliefs of self or others. Over time, these experiences in the playroom can modify one's beliefs about self, others, and the world. In theoretical approaches to play therapy (e.g., Adlerian play therapy), such schema modification is conceptualized to allow a more complex view of relationships to include positive and negative components, thus creating a more accurate depiction of the world.

Affective emotional—motivational systems of the midbrain. Panksepp and Biven (2012) identified the seven emotional—motivational systems of the midbrain that act almost instinctually within (e.g., *seeking, caring/bonding, play, lust, rage, fear, and panic/grief/separation distress*). Several of these systems, including seeking, play, and care, speak to the value of play. Often parents misinterpret bad behavior and are unable to recognize the underlying need for connection to provide safety to internal distress. Play allows us to “widen the window of tolerance” by experiencing safety in the playroom and within the therapeutic relationship while processing and integrating disturbances.

IPNB and Play Therapy

IPNB defines the mind as “an embodied and relational process that regulates the flow of energy and information” within an individual's brain and between the brains of others in our environment (Siegel, 2012, p. 2). Relationships,

and interaction with others and the world around us include bidirectional influences that contribute to the development of the nervous system. Siegel has asserted that relationships share energy and information to shape the embodied brain (including input from the stomach, heart, and body) and nervous system mechanisms. This flow of energy and information also regulates the mind. When functional and healthy, these three aspects of energy and information flow are linked through the process of integration.

All relationships have the potential to inhibit or contribute to integration. Likewise, therapeutic relationships can facilitate greater levels of awareness, regulation, and integration on many levels. Siegel (2012) identified nine domains of integration and theorized that “therapeutic, preventative, or educational measures would be aimed toward promoting integration—in the body and brain, in relationships, and in the regulatory functions of the embodied and relational mind” (p. 336). We use these nine domains as a foundation for connection to the play therapy process, creating a practical approach for therapists to connect the current neurobiological research to their own child counseling practice (see Table 1).

Nine Domains of Integration

The nine domains of integration (Siegel, 2012) include: *consciousness, bilateral, vertical, memory, narrative, state, interpersonal, temporal, and transpirational or identity integration*. We briefly outline each domain of integration and application to play therapy in the following sections.

Consciousness. Integration of consciousness contributes to our here-and-now awareness of each of our senses, thoughts, feelings, or connection to others. Consciousness can be practiced and taught as a skill. Our ability to be mindful can be developed by intentional experiencing each of the areas of awareness individually as differentiated parts, as well as experiencing them as linked and related. This present moment awareness can only be accomplished if the child feels safe and is not flooded through diffused physiological arousal of the SNS. The playroom can be created to convey comfort and safety by developing a space that is child-friendly, encourages exploration, and invites

Table 1
Interpersonal Neurobiology Domains of Integration and Play Therapy Approaches

Domains of integration	Domain summary	Play therapy skill/technique
Consciousness	Awareness of the here-and-now and mindful acceptance for experiences in the moment.	Playroom design Therapeutic relationship Activity or reflection to engage all senses
Bilateral	Connection between the left and right hemispheres.	Brain in the palm of your hand model Connect to redirect "Be with" attitude Reflection of feeling Name it to tame it
Vertical (integrating upstairs and downstairs brain)	Connection between "top" and "bottom" regions of the brain (residing throughout the body) that allow for receptivity of internal experiences and higher order thinking.	Engage, don't enrage. Rule of thumb: Say it in 10 words Reflection of feelings Encouragement Limit setting Use it or lose it
Memory	Differentiation between implicit and explicit memories that allows the past to be experienced as the past.	Use the remote of the mind Metacommunications Remember to remember
Narrative	Meaning made of our experiences through the story we keep and share.	Retelling of stories (i.e., puppetry, dance, art, music, sandtray, or free play) Externalization of problems
State	Resolution between different and sometimes conflictual parts of ourselves and personality.	Let the clouds of emotion roll by SIFT Exercise mindsight Focus on the breath
Interpersonal	Connection between two individuals when we resonate with one another.	Increase the family fun factor Facilitative responses Connect through conflict
Temporal	Organization of time (past, present, future); existential questions purpose/finality of life.	Facilitative responses Process and integrate events into life story
Transpirational	A perceived interconnection to the whole of time, place, people.	Not developed until adolescence

Note. SIFT = sensations, images, feelings, and thoughts.

use of the space and toys (Kestly, 2014; Landreth, 2012). Likewise, therapeutic presence contributes to the safe environment experienced by the child and supports conditions for change to take place (Crenshaw & Kenney-Noziska, 2014; Geller & Porges, 2014). The therapist's use of self is the foundation from which we can address the intentional integration of IPNB principles. The therapeutic presence and relationship between child and therapist can also enable the connection between self and others.

Children can be taught the "brain in the palm of your hand" model to explain arousal, flooding, and self-soothing processes and benefits (Siegel, 2012). In so doing, a shared language between child and therapist for here-and-now

responses can be created. Finally, the therapist may select activities that can engage all five senses or reflect sensory information the child may be experiencing while engaging in play. For example, most playrooms are equipped with sand, paints, and water access to provide opportunities for sensory experiences (Landreth, 2012; Kottman & Meany-Walen, *in press*; Ray, 2011). Therapist reflections for the sights, sounds, smells, and tactile experiences direct the child's attention to the current moment.

Bilateral. Bilateral integration seeks to connect and collaborate between the unique functions of the left and right hemispheres of the brain. Although the left and right hemispheres perform similar functions, on a more

simplistic level, the left hemisphere tends to activate more during logical, linear, and literal processes (Siegel, 2010). Conversely, the right hemisphere is more symbolic and creative. Each hemisphere attends to essential information—the right contains our autobiographical memory and the left provides words to make sense of our experience. When disintegrated, a child struggles to communicate with others; there appears to be a mismatch between emotions and cognitions. For young children, integration may not have yet occurred; thus, the play therapist has an opportunity to enhance learning within the playroom. To encourage bilateral integration, the therapist can create opportunities to “connect to redirect” (Siegel & Payne Bryson, 2012). This strategy enables the therapist to connect with the child on an emotional level and then redirect cognitively, engaging first the right hemisphere then connecting it to the left hemisphere. With repetition, the child will be able to identify his or her emotions and cognitively redirect oneself when needed.

In the play therapy process, the therapist is using skills throughout the therapeutic relationship to constantly and consistently connect with the child. Landreth and Bratton (2006) described this process as the “be-with” attitudes in which the therapist demonstrates messages of “I care,” “I hear you,” “I am here,” and “I understand.” Through expression of these attitudes, the therapist is creating opportunities to connect right brain to right brain with the child. The therapist also uses verbal expression of emotions—reflection of feelings—to label what the child is experiencing in the moment (Landreth, 2012; Kottman & Meany-Walen, in press; Ray, 2011). By first establishing a right-brain to right-brain connection, the therapist communicates to the child that he or she is understood and accepted for the feelings expressed. Then by labeling those feelings, the therapist is creating opportunities for bilateral integration—connecting the right to left hemisphere.

Vertical. Vertical integration includes information from the entire body as a part of our conscious experience. This type of integration allows an individual to move from reactivity of a stressor or triggering event (“downstairs brain” engaged—limbic area) to receptivity for our internal experience as a part of higher order thinking (“upstairs brain” engaged—prefrontal cortex). Because the prefrontal cortex is not

fully developed until mid-20s (Siegel, 2013), the play therapist can provide learning opportunities to begin developing vertical integration. Yet, the child is still learning and will not always be capable of fully accessing his or her upstairs brain consistently. Siegel and Payne Bryson (2012) provided an example of teaching kids about their upstairs and downstairs brain through the “hand model of the brain.” By describing the hand model of the brain, children can put a visual representation to their experiences—both emotional and cognitive, thus creating a greater level of awareness of their own bodily sensations.

Play therapists can be intentional in the play process as well to create increased awareness of the child’s experiences. Another strategy is called “use it or lose it,” in which the child activates his or her “upstairs brain” through activities (Siegel & Payne Bryson, 2012). Play therapists integrate many interventions into the play therapy modality to best meet each child’s needs. Use of storytelling is a common intervention used to help children retell experiences that were difficult or troublesome for them (Kottman & Meany-Walen, in press). The therapist may initiate storytelling to help the child connect his or her “downstairs brain” with the upstairs. In this example, the therapist is attuned to the child’s needs and recognizes the area that may be impeding the child’s progress in play therapy. Through storytelling, the therapist uses a custom-designed therapeutic metaphor that is related to the child’s own experiences but different enough to establish safety (Kottman & Meany-Walen, in press), thus enabling the *play* circuitry to be engaged in this process (Panksepp & Biven, 2012). Storytelling includes a beginning, middle, and end—in which the main character overcomes the problem in a clear, concrete process. The child witnesses the therapist telling the story first, engaging the child’s “upstairs brain.” For younger children, their developmental level may not warrant cognitive processing; however, repetition of the story can still create vertical integration. For older children, this process can be more explicit. By reading a child’s nonverbal signals to assess his or her level of readiness to process, the therapist can purposefully discuss the obstacles and resolution in the story to enhance vertical integration.

Memory. Memory integration refers to a developed sense of self across time where implicit memories are differentiated from explicit, and factual and autobiographical memory are linked. This level of integration allows us to experience the past as the past, instead of feeling flooded by emotions, images, sensations, or behavioral patterns. Based on previous experiences, “implicit memories cause us to form expectations about the way the world works”—to develop mental models of how to respond when certain emotions are triggered (Siegel & Payne Bryson, 2012, p. 72). To encourage memory integration, it is important to help children recognize when a mental model is triggered and then attach facts and reasoning to that model.

In play therapy, therapists can use reflection of meaning or metacommunications to increase awareness of these mental models. Metacommunication is higher order communication about the verbal and nonverbal responses the child is making toward the therapist or in the session (Kottman & Meany-Walen, *in press*). Small nuances that the child communicates during session may relate to an internal struggle that he or she is experiencing, but cannot recognize cognitively. Through these reflections, the therapist is drawing the child’s attention toward these nuances. Once the child is aware, the therapist can begin using interventions to make the implicit, explicit. For example, the therapist can teach the child to use the “remote of the mind,” another intervention outlined by Siegel and Payne Bryson (2012). This strategy empowers the child to pause, rewind, and fast-forward through the story when he or she begins to feel flooded by the implicit memory. Through multiple iterations of narrating and renarrating the story, the child is able to accomplish memory integration.

Narrative. A child experiencing narrative disintegration seeks to be safe, seen, soothed, and secure. Skewed narratives develop when expectations of self, others, or the world are violated. Narrative integration shows how an individual is able to reach resolve and make sense of their experiences, moving negative or traumatic experiences from the present to the past (Spiegel, Malchiodi, Backos, & Collie, 2006; Siegel, 2012). Sharing a personal narrative with others requires engagement of bilateral processes and intrahemisphere integration. Therefore, storytelling allows for integration of

thoughts, sensations, and feelings within the brain (Siegel & Payne Bryson, 2012).

Yet, true storytelling may precede language development because our brains work outside of conscious awareness to create neural networks by building connections that make meaning of our experiences (Badenoch, 2008). Storytelling in play therapy can occur through art, dance, sandplay, puppetry, music, or free play. Storytelling activities may be useful for children to externalize their internal struggles (Butler, Guterman, & Rudes, 2009). This externalization of experiences can provide relief and recovery. However, it is critical for the therapist to match activities based on developmental level or child’s readiness and support narrative integration.

State. State integration refers to how we resolve the internal conflicts between parts of our personality. A state is a momentary experience of a feeling. State integration is influenced by our social relationships and experiences. We can learn or resist coherent functioning within any one state. Some individuals may confuse states in the current moment with character traits or a more salient definition of identity (“I feel anxious” or “I am anxious”). Play therapists can intervene by acknowledging other truths within the current moment of awareness to reinforce a state as temporary and to provide choices to the child for where to focus attention thereby reshaping the brain. Siegel and Payne Bryson (2012) have presented several strategies for increasing state integration that can be adapted within play therapy, including: letting the clouds of emotion roll by, SIFT (sensations, images, feelings and thoughts), and exercising mindfulness.

“Letting the clouds of emotions roll by” means developing an understanding for the temporary nature of feelings (Siegel & Payne Bryson, 2012). In so doing, children are more resistant to getting stuck in these emotional states and more aware of other choices available. In the playroom, this development of understanding is possible by validating a child’s emotional state through reflection of feeling or meaning and acknowledging the fluidity of feelings about our experiences. Teaching children how to differentiate between thoughts that “I feel angry” (state) and “I am angry” (trait). Distinguishing between state and trait can contribute to a more adaptive narrative for the self.

“SIFT” refers to giving attention to the sensations, images, feelings and thoughts that affect us and determine our state of mind (Siegel & Payne Bryson, 2012). Children are encouraged to SIFT through the activity and different states within their mind. This activity includes developing a richer vocabulary for the subtleties between different emotions (e.g., mad, angry, furious) and noticing internal cues associated with experiences in our environment. In play therapy, this can be accomplished by having toys and activities available that incorporate all of the senses (e.g., sand, water, paint). Also, play therapists can help bring the child’s attention to the different aspects contributing to a state of mind through interventions such as reflection of feeling, reflection of content, or tracking.

Finally, “exercising mindsight” requires education for children to learn how to calm themselves down, refocus their attention, and integrate their different states, feelings, and desires. Calming techniques, like focusing on their breath, can be taught and integrated within the playroom. Therapists can use pinwheels to demonstrate deep breathing, bubbles for slow controlled breaths, or balance a toy on a child’s stomach while taking deep belly breaths together. Nondirective play therapists can add these materials to their play space for children to explore. Directive therapists can draw the child’s attention to these materials as it fits with the child’s presenting issue to augment state integration.

Interpersonal. Interpersonal integration introduces the integrated and differentiated self to another system. The transition from a “me” to a “we” perspective allows interpersonal connection and linking to a bigger meaning and level of intimacy. Human brains are developed with the purpose to interact with the environment and others in the community (Siegel & Payne Bryson, 2012). The brain integrates information and input from others by regulating our body, providing balance to emotional states, and creating self-awareness when we resonate with another. Two systems resonate when their emotional profiles match, which means we perceive and interpret the emotional state of another in our environment. When minds feel connected, their neural firing becomes more coherent. In this way, the mirror neuron system contributes to the capacity for empathy. Siegel (2010) as-

serted that mirror neuron activation also contributes to the therapeutic process and development of self-regulation through attunement and coherence.

In play therapy, the interaction between child and therapist encourages the natural healing that occurs when two systems resonate with one another. Facilitative responses communicate a trust and overall belief in the potential of the child to be independent and make effective decisions for him- or herself within the safety of the playroom (Landreth, 2012). Play therapy interventions, such as returning responsibility and allowing the child to take the lead, empower interpersonal integration within the playroom. Related, children participating in group play therapy demonstrate improvements to socioemotional competence and skills (Chinekesh, Kamalian, Eltemasi, Chinekesh, & Alavi, 2014). Similarly, play therapy techniques applied in family therapy seem not only to increase involvement by the child, but also to enhance positive emotional experiences within the family during family therapy sessions (Willis, Walters, & Crane, 2014). The play therapist provides a nurturing relationship and source of connection essential for the growing mind and child.

In situations where parental attachment may be disrupted or disorganized, the therapeutic relationship can contribute to future resilience as the child grows and attachment changes (Siegel & Hartzell, 2003). Secure attachments develop from (a) attunement of internal states to those with whom we are interacting; (b) balance of emotion, body sensations, and state of mind; and (c) coherence from internal integration and interpersonal connectedness (e.g., ABC’s of secure attachment; Siegel & Payne Bryson, 2012). These ABC’s are achieved through consistent patterns of communication, and are the goal for therapeutic relationships between child and therapist. Play therapists who convey authentic emotional responses in session can widen the window of tolerance for the difficult emotions of child clients (Dion & Gray, 2014). Strong and healthy relationships with others are a “source of strength for the child’s developing mind” (Siegel & Hartzell, 2003, p. 103). Consistently strong relationships with children can be challenged when limits are tested, boundaries are crossed, or conflict arises.

Siegel and Payne Bryson (2012) encouraged “connection through conflict” as a whole brain strategy for building relationships with children. Conflicts are to be viewed as opportunities for learning, and the therapist models a healthy relationship and response to conflict. Whether play therapists attempt to join with a child themselves or to teach parents to incorporate these interpersonal skills in family play therapy, the goal of a strong, consistent relationship and attachment are the same. Yet another objective in increasing interpersonal integration is to “increase the family fun factor” (Siegel & Payne Bryson, 2012). Increasing family fun can be accomplished by family members spending time, having fun, and developing family rituals. Each of these approaches can contribute to integration of the child’s self with others (Siegel & Payne Bryson, 2012). Therefore, individual, group, or family play therapy provides opportunity for deeper understanding of the relational brain and more meaningful connection in relationships.

Temporal. Temporal integration allows us to embrace the dissonance that occurs between our natural desire for certainty, permanence, and immortality with the equally natural reality of uncertainty, transience, and mortality. Developmentally, young children lack the capacity to understand personalized conceptualizations of death (Himebauch, Arnold, & May, 2008). So perhaps this component of temporal integration may not be applicable for most children. Yet, temporal integration also refers to the connection of self in time related to the past, present, and anticipated future (Siegel, 2012). Self-knowledge is increased by creating our life story through experiences and interactions with others.

Children can communicate stories (as discussed with narrative integration), developing a stronger sense of their experiences as having a beginning, middle, and end. Play therapists provide a safe, nonjudgmental environment with the child. In this space, children can play out events from their past as a way to process and integrate those events into their life story (Siegel, 2012). Facilitative responses from a play therapist (including tracking and reflection of meaning or content) can be used by the child to make sense of both internal and external experiences (Landreth, 2012). In this way, play therapists can add to temporal integration of the child.

Transpirational. Transpirational or identity integration can be thought of as an “integration of integration” (Siegel, 2012, p. 386) where a much larger sense of belonging and purpose drives behaviors through social, community, or planetary connection. This higher order conceptualization of the world is not developed in young children. During the preoperational stage, from age 3–6 years old, a child’s thinking is egocentric and concrete (Berk, 2012; Piaget, 1951). At 7–11 years of age, children develop concrete operational thinking. Children in the concrete operational stage are better able to think logically, but struggle with abstract or hypothetical concepts. Therefore, transpirational integration may be reserved for inclusion in work during adolescence into adulthood.

Conclusion

The architecture of the brain changes with experience and exposure to stimuli in our environment, including relationships with others. In the same way that adverse experiences and trauma inhibit neuronal growth and structures, therapeutic relationships and healthy connection with others can exert a positive influence (Badenoch, 2008; Siegel & Hartzell, 2003). Play therapy techniques compliment discoveries in neuroscience for the power of relationships to influence neuronal growth. In early childhood, the brain undergoes tremendous growth and experience lays the foundation for neural network formation; therefore, this time period may be critical for intervention attentive to brain-based theory and outcomes. Armed with scientific rationale for the power of play and play therapy, play therapists may be better able to attune and connect with clients, explain services and techniques to parents, and advocate for the profession as a whole. To move the field in the direction of scientific rationale, it would behoove researchers to examine how play therapy fused with neuroscience tenets effect the process and outcomes of children participating in play therapy.

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