

# THE SCIENCE OF PSYCHOTHERAPY



JULY 2019



## EDITORIAL

Welcome to the first issue under our new banner of *The Science of Psychotherapy*. Even though neuroscience is a vital element of the complex system of psychotherapy, it is not the only element. There is so much to learn from the other elements of our biology and the systems within it. A good article does not need to focus on the neuroscience, although most good articles will include, or at least acknowledge, some relevant neuroscience – simply because the brain is a very important element! We use the word *science* in the context of information that is based on reliable and rigorous investigation, careful thought, and experiment. We look forward to publishing a range of articles from broad research to specific cases, and proving established ideas, innovative propositions and even speculations – as long as they are backed by or based on good science.

*The Science of Psychotherapy* strongly encourages your responses and ensuing discussions as a valuable watchdog of the veracity of what we publish and also as an inspiration to explore even further. The recurring theme in our “Where to Now?” feature was the need to integrate what we know and what we do, to find the common ground rather than the differences and separations. We look forward to exploring many exciting themes: What works and what doesn’t? What do we know now and what can we learn? What are the innovations and the possibilities coming in our future?

We start this issue with the first of two parts about The Parent-child Neuropsychotherapy Protocol by Thedy Valiz in the USA. He has chosen *The Science of Psychotherapy* as the first place to publish his detailed description of his protocol and we are pleased to assist in presenting the protocol for your information, comment and discussion. I believe his utilisation of neurodevelopmental dynamics when working with families who have a child exhibiting emotional and behavioural difficulties is both new and innovative. It also stands on the solid ground of some excellent science.

Innovative thinking is equally evident in Aldrich Chan’s article, Consciousness, Integration and Individuation through Active Imagination. He discusses the importance of non-conscious processing in our human psychology. This article is excellent follow-on from my question in the last issue: Where to now? Finally, there is a special *Last Word* comment by Ernest and Katherine Rossi. As promised, some authors will continue to express their thoughts through our Last Word column. The Rossi’s take us, once again, into the important and progressive field of quantum physics. They bring to our awareness the doors we need to open so that the science of psychotherapy is included in the planning of future quantum research.

I hope this issue inspires, educates and prompts your engagement to write to us with your responses, comments and discussions. We are always keen to see how you, our readers, will take us beyond the growing edge.

RICHARD HILL | EDITOR

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# **Consciousness, Integration & Individuation Through Active Imagination**



**by**  
**Aldrich Chan, Psy.D, Neuropsychologist**



## OPINION

Several years have passed since the split brain studies conducted by Roger Sperry and Michael Gazzaniga (1962). We know the brain is differentiated, and that the two hemispheres specialize in the different functions that can be fairly generalized (McGilchrist, 2009). Since then, research has been uncovering a myriad of other systems in the brain, some of which operate in simultaneity, and others in sequenced relationships with one another. Many of these systems are governed by multiple feedback and feedforward loops, and a single region of the brain may serve a variety of functions, contingent upon the system it is functioning in. From the discovery of epigenetics (Masterpasqua, 2009) to spindle cells (von Economo, Koskinas, 1929) and mirror neurons (Pellegrino, Fadiga, Fogassi, Gallese, Rizzolatti, 1992); to the sharing of social cognitive real estate with functions of the self (Christoff, Irving, Fox, Spreng, Andrews-Hanna, 2016); and the overlapping elicitation of regions of physical pain with the processing of emotional pain from social rejection (Kross, Bergman, Mischel, Smith, Wager, 2011), mounting evidence suggests that the brain is in fact fundamentally social. At a minimum, any study or practice of human functioning must include the environment and culture they are immersed in.

Psychologists and neuroscientist alike, are also well aware that there is a disproportionate amount of non-conscious processing in comparison to conscious processing. Studies on subliminal messaging (Ruch, Züst, Hen-

ke, 2016), priming, racial biases (Fitzgerald & Hurst, 2017), and the phenomenon of transference (Freeman, Modell, 2007), shed light on how little we know of ourselves and what is influencing us. This comes as no surprise to the psychoanalyst. What is still being debated is whether there is a specific structure and function of the unconscious, as it appears psychologically. There are many eligible contenders, and no 'gold-standard' framework. In the absolute challenge that underlies the ability to measure subjective structures, much more so unconscious ones, what we essentially strive for, with logic, are models that are in alliance with widespread clinical experiences, biology and Jamesian pragmatism. How else can we measure that which we cannot see, but only experience, or infer through behaviors and interpersonal dynamics?

The fact that people, even the elderly, *can* change has been confirmed by research on plasticity (Park & Bischof, 2013), and the degree to which psychotherapy may alter brain structure and function have further promoted the science of psychotherapy (Cozolino, 2010). Psychotherapists feel encouraged that their methods are biologically effective, whilst the neuroscientists caution the rest to be careful not to inflate the findings. Of course, mental functions are associated with the brain, with several years of lesion studies supporting the logic that when the brain is compromised, so will certain functions (Lezak, Howieson, Bigler, Tranel, 2012). This should come as no surprise, as even a material

***After years of intuited belief, therapists may now rejoice that the bi-directional relationship remains quite accepted throughout the community.***

reductionist must assume that any changes in psychological states must have some reflection in neural states. From a material perspective, what is the mind, if not emergent properties of matter reflecting on itself? Likewise, it is quite clear now, that psychological changes may result in large scale changes throughout the brain, such as the case of individuals vulnerable to traumatic events (Chan, 2016; Zhang et. al. 2015). After years of intuited belief, therapists may now rejoice that the bi-directional relationship remains quite accepted throughout the community.

The trajectory of formal psychotherapeutic development began at the level of the unconscious (psychoanalysis), and has since expanded its territories into cognition, behavior, humanism, existentialism, development, mindfulness, biology (e.g. somatic, EMDR) and others. To be a competent therapist, there is a need to become familiarized with several different theories, in order to be capable of tailoring an approach to serve a wide range of clients. Human existence is wildly complex, and a nefarious trap in psy-

chotherapy would be the neglecting a relevant dimension. The complexity of psychological experience alongside the currents of scientific endeavor, has driven us to find anchors for approaches, imposing a necessary grounding and expansion of variables considered. To this, we find interpersonal neurobiologists, such as Dan Siegel (1999), Alan Schore (2012) and Louis Cozolino (2010) to have pertinently stressed the importance of: the right-hemisphere, attachment, evolutionary psychology, integration, the social brain, mindfulness and consilience; when considering how to incorporate neurobiology in psychotherapy. New bundles of methods emerge from the integration of fields, theories, techniques, and technologies, with many older methods becoming obsolete, or more relevant/effective as they are casted in a new light.

One frontier of relevance for mental health professionals is the frontier of consciousness. While emergent materialists are still at large (Beaumont, 2008), the conviction that a continuum of consciousness exists in all matter, and is the “primal stuff,” or pan-psychism (Chalmers, 1996) has become increasingly popular. There is even an attempt to measure levels of consciousness, through integrated information theory (Tononi, Boly, Massimini, Koch, 2016). Perhaps matter and consciousness rest on a continuum themselves, as the front and back of a coin; two features of the same substance, and they are needlessly categorized as independent of one another, as Nagel (2012) would suggest in *neutral monism*. Even more radical, perhaps the brain is more of an antenna, with its complexity allowing it to ‘tune’ into frequencies of consciousness (Nuñez, 2010); or maybe you subscribe to Dan Dennetts theory (1991), that consciousness is an illusion. At this

moment, we cannot prove or disprove these theories. It seems likely that to gain momentum towards the 'solution' to the *hard problem* may require an approach that integrates neurophenomenology, psychology, quantum physics, biology, philosophy, mathematics, and computer science.

The current debates on the origins of consciousness and its relationship to matter does not preclude the necessity to do our best in formulating a theory. In fact, some would argue that consciousness might be the only thing we can be certain of, and what else may be the origin of meaning, if not consciousness? It is in this field of consciousness that we operate from, and it is because of consciousness that we can have (or appear to have) the ability to navigate our lives, making us at least partly responsible, for the direction we are headed. In

this article, I will provide one hierarchical theory of consciousness and its relevance in psychotherapy.

In the spirit of Endel Tulving, Vandekerckhove and Panksepp (2009), I propose that consciousness may be understood through the lens of hierarchically ordered levels, namely the anoetic, noetic and autonoetic. Autonoetic consciousness, is understood as the layer of most complexity whose fulcrum is composed of these two baser levels. The anoetic, is considered an unreflective processing "a mixture of primary process affective and sensorial-perceptual-cognitive experiences... critically important for the creation of emergent implicit procedural memories" (p. 1020). For example: When learning how to ride a bike, one does so through trial and error, eventually the memory of riding a bike becomes automatic, as sense-memory





becomes embedded in non-conscious circuitry. Thereafter, riding a bicycle, is much easier, as the process required to learn is no longer necessary. Anoetic consciousness, allows us to have a stream of waking experiences, but with a lack of knowing.

Noetic consciousness is the first sense of 'knowing', yet ever tied to the present, without the ability for conscious mental time travel. So while there is a 'knowing' of self, there is no self-abstraction involved, no reflections on the known autobiographical self. In the noetic consciousness then, there exists a narrative, influenced by the past and potential future, but no ability to reflect on it and contribute to its development. It is associated with semantic memory systems (factual), but not episodic (autobiographical).

The reason why we can reflect on ourselves, our history and modify our actions towards the future is because we have what Endel Tulving (1985) termed "autonoetic consciousness," the highest form of consciousness that allows us to experience our selves as processes existing through time. Autonoetic consciousness (AC) houses two elements in its definition that has convinced me to be partial towards its usage, as opposed to term such as awareness or consciousness. In its definition there are the elements of time and space. AC includes chronesthesia, or the awareness of time, and beyond, as it encompasses the capacity for us to project the self into the past to retrieve an episodic memory or project the self into the future to simulate a future event. It also includes space, and by space, I mean the 'space' necessary for us to be aware of having an autobiographical self in the first place. The ability to know that

we know. Inspired by Darwinian natural selection, I think that *autonoetic consciousness was an evolutionary necessity, enabling us to contribute to the process of selecting psychological and socio-cultural traits that might be passed down through the generations.*

These levels may be further accompanied by ever more complex emergence of the self, as described by Antonio Damasio (2010), see figure 1.

From a neurobiological perspective, two case studies emerged on subjects unable to "mentally time travel," despite other functions intact. The first was presented by Tulving, called K.C. and the other M.L. who endured more specific injuries to shared spaces, by Brian Levine and his colleagues (1998), whereby lesions were encountered in the right ventral prefrontal cortex, and a fiber pathway connecting the temporal lobe and ventral cortex, the uncinate fasciculus. What problems do people without autonoetic consciousness suffer from? Levine (1999) found support that autonoetic awareness serves as a platform to inhibit maladaptive behavior. The ability to inhibit, is crucial for psychotherapy, regardless of the theory. Insight and the selective targeting of cortical circuitry, plays a large role in effectively regulating limbic activity, in order to assist a patient in emotional regulation. Without inhibition, we would be unable to delay gratification for a more promising future, or prevent ourselves from acting out uncontrollably in an inappropriate context. Memory and mental time travel allows us to utilize our history to better serve our future.

Another question of interest, is how do we know that self-identity and AC, are autonomous

Figure 1 Levels of Consciousness

Antonio Damasio (2010)	Endel Tulving (1985), Vandekerckhove, Panksepp (2009)
<u>Proto-self</u> Primordial feelings, awareness of body, no language, experiences pain and pleasure	<u>Anoetic Consciousness</u> “implicit procedural, sensory, and affective memory and on the conceptualization and empirical foundation of raw affective consciousness” (Vandekerckhove, Panksepp, 2009)
<u>Core self</u> “relationship between organism and object... unfolds in a sequence of images that describe an object engaging the protoself, and modifying the protoself, including primordial feelings” (p.24).	<u>Noetic Consciousness</u> Includes Anoetic consciousness Knowing Associated with semantic memory No mental time travel, but influenced by events in the past
<u>Autobiographical self</u> “defined in terms of biographical knowledge pertaining to the past as well as anticipated future..higher reaches embrace all aspects of one’s social persona constitute a “social me” and a “spiritual me” (p.24)	<u>Autonoetic Consciousness</u> Includes anoetic and noetic consciousness Knowing that you know Associated with mental time travel Self-awareness

systems? One route is through the exploration of experiences recounted from the ingestion of certain hallucinogens and/or experience in long-term meditative practitioners. The experience I am speaking of is “ego dissolution,” the complete dissolving of self-identity and being ‘at one’ with the nature. In these states, the phenomenological experience appears to be very similar, “blissful,” “peace,” “awe,” or “oneness,” are all examples used frequently. One comes to also wonder the contributions of right-hemispheric processing in instances experienced by a left-hemisphere stroke by respected neuroanatomist, Jill Bolte Taylor:

“As the language centers in my left hemisphere grew increasingly silent and I became detached from the memories of my life, I was comforted by an expanding sense of grace. In this void of higher cognition and details pertaining to my normal life, my consciousness soared into an all-knowingness, a “being at one” with the universe... I found it odd that I was aware that I could no longer clearly discern the physical boundaries of where I began and where I ended. I sensed the composition of my being as that of a fluid rather than that of a solid. I no longer perceived myself as a whole object separate from everything. Instead, I now

## *If one wishes to develop increased “in-sight,” one is tasked with the mission of developing relationships with other psychological systems associated with other operating systems in the brain.*

blended in with the space and flow around me” (p. 41-42).

Would these experiences of ego-dissolution be a regression to an earlier form of consciousness, like the anoetic, or is it the dissolving of self-identity, and complete identification with auto-noetic consciousness? Perhaps the release of the self-identity bind, enables an experience of temporary right-hemispheric dominance. Just like consciousness, we do not know at the moment, but what I find very promising about the existence of such experiences, is the fundamental capacity to alter the narrative that drives ones very being.

When it comes to the development of ‘being,’ or how one fundamentally orients and steers the process of their existence in the world, there is a necessity to be connected to their internal world. This hardly seems difficult to digest. The autobiographical self is like-

ly but one of the many nodes, related to activities of the many operating systems in the brain, the difference being it tends to be at the center of consciousness. It is one live narrative amongst many others, attempting to assert its dominance. If one wishes to develop increased “in-sight,” one is tasked with the mission of developing relationships with other psychological systems associated with other operating systems in the brain.

We find that time spent exploring the world within, such as in meditation, results in alteration in brain structure and function, associated with improved cognition, emotion regulation, mood (Sood & Jones 2013), and even immune functioning (Davidson et al., 2003). Moreover, an introspective activity like that of expressive writing, has also been associated with improved physical and mental well-being (Krupan, et. al. 2013). I think it is safe to assume that behaviors resulting in improved health and harmony, is nature’s ‘pat on the back.’ There are other activities that have been tailored to promote integration, and the abiding in consciousness, such as Dan Siegel’s Wheel of Awareness (Siegel, 2018). Given that these approaches are relatively well known, I would like to introduce an alternate, less ‘traveled’ road.

Interpersonal Neurobiology views the achievement of balance systems and an integrated brain to result in healthy living. Embedded in every interpersonal approach is also the “intra-personal,” or how the internalizations of social and cultural experiences may be influencing ones Self<sup>1</sup>. Indeed, I am referring again, to psychological reflections of biological operating systems in the brain, or vice-ver-

<sup>1</sup> I am defining it from an analytical perspective as the sum total of non-conscious and conscious processes.



sa. I cannot help but view parallels between the analytical concept of individuation, which promotes the psychological integration of the unconscious with the conscious, and the more modern concept of integration of neural systems.

Jung has the distinct effect of instigating angst in some academic mental health professionals. Yet it would seem only wise, to consider his contributions in our current scientific climate. Analytical psychology has in fact found empirical support, in the form of symptom reduction, improved interpersonal functioning, personality structure, and quality of life. Moreover, improvements have been found to be stable for up to six years. Roesler (2013)



Carl Gustav Jung

also discovered that patients who had undergone analytical therapy had rates of health care usage below their previous use, and the average populations. In particular, one creative activity from analytical psychology, that I have found of particular assistance is that of active imagination. I do warn the reader though, that although active imagination is an important aspect of analytical work, I have yet to find any attempt at studying the efficacy of this technique independent of other processes. I am writing from my own experience using it, its theoretical resonance, and my clinical experiences of others (practice-based evidence) using this technique.

In this method, one is asked to engage in dialogues with aspects of one's Self. Jung frequently encountered archetypes and personal complexes, which helped him overcome a rather challenging period of his life, post-Freud that caused him much dissonance. This formed his infamous "Red Book." I offer here, with slight trepidation to my traditional Jungian colleagues, an introductory approach to active imagination that can be applied as another therapeutic tool, independent of theoretical orientation, to assist with processes of integration. I firmly believe the benefits are too great, for a technique with such potential to be underutilized. In this activity, we give voices to those aspects of Self, that are manifesting as troubling, or that may be overlooked, neglected, or rejected. In concomitance with the requirements for neural integration, one is not to deny any aspect of existence, but rather "gather the world to one's self; as consciousness expands beyond 'the petty oversensitive personal world of the ego'" (Jung, 1928 p. 178).

Step 1: "In order to grasp the fantasies which were stirring in me "underground," I knew that I had to let myself plummet down into them, as it were" (Jung, 1961, P. 178). On December 12<sup>th</sup> 1913, Jung began his first journey into active imagination. "I was sitting at my desk once more, thinking over my fears. Then I let myself drop" (Jung, 1961, P.179). The first step is identify and hold, or 'drop' into the emotion or psychological/physiological compulsion(s) that seem to be currently 'interfering' with ones functioning. Helping patients identify systems that may be used in active imagination is simple, what are the emotions, impulses, or habits that brought them to therapy? Utilize what is present, or salient in the moment.

Step 2: Jung then allowed his imagination to take its own life, these came in the form of images. "...near the steep slope of a rock I caught sight of two figures, an old man with a white beard and a beautiful young girl" (Jung, 1961, p. 181). In this phase, he allows his imagination to weave a motion picture so to speak. Internal tensions may paint a live picture, and characters, representative or at least related to these tensions.

Step 3: He continues, "I summoned up my courage and approached the as though they were real people, and listened attentively to what they told me" (Jung, 1961, p. 181). At this point, one is to give them a voice, so that they may be better understood. One may begin a conversation with them, or they

may begin one with you. Sometimes, they seem to name themselves and other times one may assign a name to them, whatever free association arises. "Soon after this fantasy another figure rose out of the unconscious...I called him Philemon" (Jung, 1961, p.182).

Using the example of an impulse whose fulfillment is maladaptive and undesirable in some way, one descends into the tension, accompanying the impulse, likely an admixture of sensation and psychological experience, rather than the object of gratification itself. One is giving birth to a new psychological image or association, reflective of the tension. Once it has been given form, one may be capable of increasing their chances of de-identifying with it, thus increasing their chances of thwarting a regretful decision. The experience is now associated (with the hopes of eventually being represented) by a psychological symbol, so it is no longer an undifferentiated experience incapable of managing. Furthermore, the next time the tension arises, one may recognize it through the emergent or assigned symbol. This "separation," allows for a dialogue which creates a relationship. Here then, we find one is building a conscious relationship with some aspect of themselves. "The essential thing is to differentiate oneself from these unconscious contents by personifying them, and at the same time to bring them into relationship with consciousness. That is the technique for stripping them of their power" (Jung, 1961 p.187). It is important that in these states, the tension is held, as a dialogue ensues. "In the final analysis the decisive factor is always consciousness,

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which can understand the manifestations of the unconscious and take up a position towards them” (Jung, 1961, p.187).

Step 4: It is in a continual dialogue (one hopes a dialectic), that one may negotiate a junction of narratives, whereby ‘opposing’ sides may find increased understanding and a resolution. The processes involved with union is described in his notion of the transcendent function, which is important to acknowledge but beyond the purposes of this article. Of note, even if no union has been established, and indeed these dialogues may last quite some time, the mere act of having the sides dialogue results in a diminishment of reactivity. In session, one may further analyze these dialogues patients have come up with,

and even continue them, by asking them to ‘inhabit’ the symbol once more and speak from their perspective. In extension, should the patient be interested in the analysis of dreams, dream images may be brought back up into imagination, and used in collaboration within a therapeutic session. What might be the emotions and thoughts of this character? What might character x be saying in this moment? Imagination is a powerful tool often underutilized in psychotherapy. In any belief system or orientation, it may be beneficial to remember that the happenings in imagination are psychological realities, which whether you believe they stem from the material brain or are in some other dimension, are arising nonetheless. From a material perspective, images are arising from some material substrate, whereby



embellishing them and understanding them may be profitable.

Importantly, he cautions us all, that “it is equally a grave mistake to think that it is enough to gain some understanding of the images and that knowledge can here make a halt. Insight into them must be converted into an ethical obligation. Not to do so is to fall prey to the power principle, and this produces dangerous effect which are destructive not only to others but even the knower... failure to understand them, or a shirking of ethical responsibility, deprives him of his wholeness and imposes a painful fragmentariness of his life” (Jung, 1961, p.193).

It is through autonoetic consciousness that we are capable of engaging in this exercise between the autobiographical self and inner operating systems. Theoretically, this may be the empowerment of frontal-parietal-cortical circuitry in its relation to bear, or inhibit signals arising from the limbic system. We know the medial prefrontal cortex is a convergence zone for signals in the limbic system, and that it has been associated with self-functions via studies on the default mode network (Spreng, Grady, 2009). Uddin and colleagues (2005) also found that right-frontal-parietal mirror networks are recruited in activities whereby we view ourselves or hear our own voice. Her group concluded that these network may have been adapted for self-abstraction. The recruitment of these networks, and the improvement of their descending inhibitory tracts to amygdala based networks may play a role in better regulating our affect. In addition, by giving specificity and language to the emergent experience, one may be activating left biased hip-

pocampal cortical networks, to provide further discrimination to the information in right biased amygdala based fear networks (Cozolino, 2010). Instead of acting out, one may develop a more adaptive, if not, conscious response, and diffuse tension via internal or external dialogue. In this act, we are thus harnessing the recursive potential of a self-organizing system. From a neurobiological perspective, we are eliciting subjective responses from objective systems, bringing them to the forefront of consciousness, improving integration to help individual's optimize their overall functioning, wholeness, and well-being.

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The screenshot shows a website for 'The Science of Psychotherapy Academy'. The header includes navigation links: 'SOP MAIN SITE', 'ALL COURSES', 'CERTIFICATES', 'FAQ', 'SIGN IN', and a 'GET STARTED NOW' button. The main content area features a large, glowing blue DNA double helix graphic. The course title 'Therapeutic Applications of Neuroscience, Psychoneuroimmunology, and Epigenetics' is displayed in white text. Below the title, a short description states: 'This seminar presents the sea change occurring in psychotherapy toward greater integration to address health factors. This course considers epigenetics, psychoneuroimmunology and other related fields of research that make up this integration.' A green button at the bottom left indicates the price: 'Buy \$200.00'.

# The Parent-Child Neuropsychotherapy Protocol™:



A Relational and Developmental Neurogenomics Approach to  
Working with Youth and their Families

PART 1

Thedy Veliz

...the protocol conceptualizes behavioral and emotional challenges as a result of a dysregulated stress-response system which is expressed as an inability to self-regulate

## FEATURE

### INTRODUCTION

The Parent-Child Neuropsychotherapy Protocol™ (the protocol) (Dahlitz & Hill, 2019a, 2019b) provides a framework to address the complex challenges of working with the entire family when a child is exhibiting emotional and behavioral difficulties by encouraging parents to focus on the neurodevelopmental dynamics (i.e., dysregulation of the stress response system) that the child continues to communicate through the challenges, symptoms and behaviors that are causing relational disruptions rather than trying to eliminate the negative behavior.

The protocol is supported by relational and developmental neurogenomics theory & research (e.g., Lavigne et al., 2013; Cicchetti & Rogosch, 2012; Belsky et al., 2009; Hartman & Belsky, 2016; Belsky & Hartman, 2014; Bakermans & van IJzendoorn, 2007; Belsky, 2015; Rutter, Moffitt, & Caspi, 2006; Belsky & Pluess, 2009). The objective of this treatment is to support the development of therapeutic brain-based parenting interventions by providing short-term coaching techniques while encouraging parents to examine how their personal history might be affecting their ability to provide the support and care that their child needs





The child can only use his prefrontal cortex to engage with other people in an empathic and collaborative fashion if he feels safe through the downregulation of his stress response system. Only when our most basic needs of physical and psychological safety are met, can we move to satisfy other higher order needs including belonging to a group.



(Siegel & Hartzell, 2003) while “operationalizing empirical research and clinical practice to support the development of fulfillment and purpose” (Veliz, 2019b, para.1).

The protocol was designed with the assumption that in order for the parent to be able to help the child self-regulate, parents need to be able to self-regulate on their own. Only then would parents be in a position to lend their well-developed and regulated prefrontal cortex to the child (Siegel, 2012; Siegel & Payne Bryson, 2011) in order to help the child co-regulate. The child can only learn to self-regulate in a healthy way after he has been co-regulated by a self-regulated adult caregiver. Eventually, as children become adolescents, they need less co-regulation from the parent as neural connections between the limbic system and the prefrontal cortex develop and strengthen resulting in the transfer of the self-regulatory executive control from the amygdala to the ventromedial prefrontal cortex (VMPFC) (Baylin & Hughes, 2016).

### **The Child’s Symptoms Communicate What the Child Might Not Have**

While child and family therapists are aware that the dynamics that result in children’s challenges usually reside within the family system, in many cases the “one-person psychology” (Schore, 2002, p. 436) based traditional model of psychotherapy gets in the way of providing the most efficacious treatment for the child and the entire family. The protocol interprets negative behavior as the child’s way of communicating that something is not right and requires attention from the caregiver, as the child is unable to express his discomfort through

language. Thus, the child’s tantrum is not a behavior to be judged and treated with a consequence, but rather a symptom to be understood and “joined with” by providing “attention and presence” (Tatkin, 2017, p. 29). Unlike the traditional medical model that drives psychiatry and psychotherapy treatment approaches, the protocol does not directly attempt to treat what the child has (e.g., the symptom), but rather what the child might not have (e.g., security, an upgraded and cohesive narrative of his life, the ability to self-regulate). Thus, the protocol is a “capacity model” (Tatkin, 2017, p. 24) since instead of trying to fix negative behaviors, it focuses on helping dyads to create safe and secure interactions as described in Stan Tatkin’s Psychobiological Approach to Couples Therapy (Tatkin, 2017). In the case of a parent and child, the process of co-regulation is led by the parent in order for mutual regulation, and eventual self-regulation to occur.

Thus, whether the child is engaging in self-harm behaviors, having suicidal thoughts, using substances, or exhibiting anger, anxiety, compulsiveness, hyperactivity, hypersexuality or sadness; the protocol interprets the message from the child as being the same: “There is something wrong with me, and I don’t know how to fix it. I need help! Can you help me? Do you believe in me? Can you please tell me that I am not ‘bad’ even though I feel ‘bad’? Because if you don’t believe in me, I don’t think I can believe in myself either. But please, don’t criticize me, and don’t lecture me. I’ll shut down if you do because I will be overwhelmed by shame!”

My work with youth and their families has taught me that children suffer not so much be-

cause of the event or symptoms that motivated their parents to bring them to therapy (e.g., divorce, drug use, failing grades, oppositionality), but because they feel criticized and misunderstood by important caregivers in their lives (e.g., parents, baby sitters, educators, coaches, therapists) at sensitive stages in their development when in many cases the child can't understand himself. In addition, I have learned that parents are following in good-faith traditional cultural parenting guidance that unfortunately emphasizes behavior management at the expense of the development of emotional intimacy (Berger, 2006).

### **Research Findings Support the Efficacy of Parent Therapy Approaches**

New psychotherapy research such as a study published in March 2019 by Yale University researchers (Lebowitz et al., 2019) is starting to highlight the benefits of working with parents as compared to of traditional psychotherapy with the child. The study compared the efficacy of SPACE, an intervention provided exclusively to parents, with that of cognitive behavioral therapy (CBT) provided to children. Not only did the parents in the SPACE intervention group reported a better relationship with their children as compared to that reported by the parents of the children treated with CBT, the first author of the study stated that "regardless of what measure we used to look at the outcomes, children whose parents received SPACE were as improved and as likely to be cured from their anxiety problems as children who had 12 sessions of some of the best CBT therapy available" (Kristofferson, 2019, para. 6).

Part 1 of this article will present develop-

mental and evolutionary artifacts that guide the design and execution of the protocol and background on relational and developmental neurogenomics theory and research, followed by the protocol's treatment goals, stages, and elements. Part 2 will delve into the curative dynamics including detailed interventions that use safety, joining, and integration to down-regulate the child's stress response system while enhancing his ability to self-regulate. In order to make the content of this article applicable to cases that mental health professionals might be working with, I will to demonstrate how theory and research become operationalized by making reference to the case of Simon throughout the article.

### **SAMPLE CASE: SIMON – THE OLD SOUL TYPE**

Simon is a 14-year-old boy who is described by his mother as very sensitive, kind, insecure, and creative. Simon throws tantrums, yells that he hates his parents, and quickly becomes angry when his parents don't comply with his demands. Simon was diagnosed with ADHD when he was in second grade as his teacher complained of his inability to sit still and pay attention. He is doing poorly in school, and does not care about how his current choices might affect his future. His parents are concerned that Simon might be addicted to social media, video games, and the internet. Simon has a history of being bullied since he started school, yet he had not told his parents. Since has was a young child he would get upset when his friends would play with other kids, thus he has had difficulty maintaining friendships.



Sensitive children like Simon exhibit “annoying” symptoms like anger, manipulation, hyperactivity, defiance, obsessive behaviors, hypersexuality, and substance use. However, underneath these behaviors they are carrying immense feelings of inadequacy and shame that are commonly missed by caregivers.

Father described Simon’s behavior as defiant, oppositional, disrespectful and inconsiderate. While he was naturally good at soccer and baseball, he would give up and stop attending practice. Simon’s mother noticed that her son had an artistic inclination and prefers individual instead of team sports, and thus encouraged him to engage in creative activities. Simon has a younger brother who is very athletic and plays many team sports including soccer and baseball, and connects with his father who is also a sports fan. During times of anger and frustration, Simon states that he is stupid and a failure, and that nobody understands him. Parents

are very concerned because Simon has started to spend more time with a girl that they perceive as more mature and who is possibly using cannabis.

Note: This case is a composite designed to not only protect the confidentiality of my clients, but also to provide a didactic application of the protocol. Also, this article will advance interventions to address issues pertaining to how boys get influenced by societal norms regarding what it means to be a man. For simplicity, I will use male pronouns to refer to children, and female pronouns to refer to the caregiver.

## DEVELOPMENTAL & EVOLUTIONARY ARTIFACTS

### Disconnect Between Young and Adult Brains

Even though the adult human brain is “by far the most complex system in the known universe” (Paulson, 2012, para. 32), its sophistication is due to the orchestration of a collection of neural systems that evolved at different stages of evolution. Indeed, our logical genius and capacity for deep empathy is built on top of very primitive reptilian and early mammalian systems whose primary expertise rests on its quick mobilization in response to any experience that might be interpreted as a threat (Cozolino, 2016).

These early primitive systems, which mostly drive children’s experiences are fast acting; developed early in our evolutionary history; and have strong connections to our visceral senses, and our ability to quickly move in order to avoid danger. They are mostly unconscious, and their activity become part of what we call implicit memory. As evolution proceeded, we developed more complex systems that allowed us to imagine, collaborate with others, and develop abstract thought. These processes are more conscious in nature, and slow acting as they require coordination of various systems. These more evolved systems appear much later in the development of the child, and are not fully functional until the second decade of life (Cozolino, 2016).

Even though children require critical support and understanding from adults during their formative and vulnerable years, there is usually a mismatch between the way adult and young brains experience the world. Children

are driven by these early primitive systems that are more embodied and emotional and less cognitive in nature which might appear illogical and non-linear to the adults proving their care. This disconnect is a source of ongoing conflicts that leave children feeling misunderstood and inadequate in the eyes of their parents as they are incapable of living up to the expectations of the more logical adult brain.

The most important issue in most cases with children that are exhibiting challenges with emotional, behavioral and learning is that adults that care for them focus on the wrong problem. The problem is not fixing the challenge perceived by the adult. Instead, the problem is that adults are unable to understand what the child is trying to communicate through their negative symptoms. In a nutshell, children’s symptoms are trying to communicate that the “goodness of fit” (Grobstein, 2009, para. 18) is not adequate for the level of care and support that they need due to their brain plasticity (Boyce, 2019; Veliz, 2019a).

To the adult brain which is more logical and focused on the present and future, the focus is on the child learning to behave and to “keep it together” so that he is able to be successful in life. The child’s brain is focused on past information to predict the future since during the early years the brain takes in and analyzes past events in order to construct expectations about the future environment (Cozolino, 2014b). Thus, Simon’s father might not be able to understand why Simon is upset and being “difficult” during a weekend family camping trip. Simon might not be able to enjoy the outing with his family because he might be thinking about having to go back to school on Monday





Children are driven by early primitive systems (i.e., brain stem and limbic system) that are visceral and emotional and less cognitive in nature. This might appear illogical and non-linear to the adults providing their care.

as he might be worried about getting bullied again. If this was true, Simon's parents would wonder why Simon can't verbalize this. The challenge is that some of these mental dynamics might be implicit (i.e., unconscious). Even if Simon was aware of his discomfort, he might not want to share with his parents that he feels scared, because he might be worried about his father thinking he is weak. Some adults might even expect the child to be able to "temporarily suspend" worrisome thoughts from his mind just like adults are able to.

### **Safety Before Relating**

Thus, there are neurodevelopmental constraints that get in the way of children's ca-

capacity to engage in behaviors that adults expect from them. When a child is born, the most primitive neural structures that include the brainstem and the limbic system are fully developed (Rossouw, 2016). Thus, the child's actions will be very sophisticated when it comes to self-defense oriented "selfish and manipulative" behaviors. When adults don't understand that this type of behavior is a normal and healthy part of the child's neurodevelopmental timeline, and proceed to discipline and shame the child, this results in the child not feeling safe, causing a further upregulation of the child's defensive strategies which could be interpreted by the parent as a direct "premeditated" defiance against the authority of the parent.

This lack of safety can result in a shift from sympathetic excitement to parasympathetic withdrawal which quickly take on the intrinsic meaning of “‘I’m not lovable’ and ‘my membership in the family is in question,’ both of which are life threatening to a child, whose survival depends upon unconditional acceptance” (Cozolino, 2016, p. 10). This dynamic eventually results in core shame, and becomes interwoven into the child’s identity. This is why Louis Cozolino, author of *The Neuroscience of Human Relationships*, in referring to the evolution of core shame states that: “The fundamental question ‘Am I safe?’ has become interwoven with the question ‘Am I lovable?’” (Cozolino, 2016, p. 11).

Unfortunately, the child gets punished because his evolutionary artifacts are working properly which further strengthens the defensive circuits in his brain making them more automatic since the punishment communicates that the environment is not safe through the process of avoidance learning (Wenzel et al., 2018). As this ongoing misunderstanding continues between the child and adult, the child starts to develop emotional feelings of being constantly rejected by the parent. Ironically, parents are working against what they want; which is for the child to eventually have the capacity to use more of his reasoning capabilities to soothe his primitive defensive system (Baylin & Hughes, 2016). While initially the child’s hypersensitivity might result in challenging behaviors, the child will achieve a better capacity to self-regulate if parents focus on providing the support that the child needs so that sooner rather than later he can transition from a selfish focus on his own safety to a more collaborative and outwardly focused engagement

and reciprocity with other family members. This progression highlights the developmental need for the organism to feel safe before it has the capacity to connect, relate and have empathy for others. In a nutshell, if the organism does not feel safe, it can’t love or be a responsible active participant of any interactive group. This is a powerful neurobiological principle that appears to be ignored by traditional behaviorally-based parenting.

Thus, while traditional parenting focuses on setting boundaries and holding the child accountable through discipline, the protocol’s focus is on assisting the child to feel safe. Unfortunately, “setting boundaries” through fearful discipline tactics result in the upregulation of the child’s stress response system which communicates to the child’s limbic system that the environment is not safe. In contrast, when caregivers focus on the child feeling safe through a relationship based on unconditional love, the parent has now earned the child’s trust to provide the much-needed boundaries.

In labeling Simon’s behavior as negative, it is almost impossible to have empathy for him. If father sees him as defiant and lazy, the dominant societal paradigm kicks in and directs father to communicate disapproval for Simon’s actions. In addition, it deploys the dynamics of conditional love through which love is only provided if the child “is” the way the parent wants him to be, and taken away otherwise. Instead, what Simon needs is for his parents to help him process the feelings of inadequacy that are underneath his negative behaviors while communicating unconditional love through acceptance for who he currently is.

### **Development of the Primitive (Default) Narrative**

This conflict between the child and adult brain results in the development of what I refer to as the primitive narrative (Veliz, 2017). This primitive narrative starts to conceptualize the child's place in the world as one of inadequacy driven by his perception of others as not understanding him which leads him to develop an inherent doubt that others could be helpful or trustworthy, especially adults. The child's feelings of inadequacy coupled with his inability to trust others leaves him with a sense that the future is not a hopeful and exciting destination. Simon's parents can't understand why Simon would want to sabotage his future by not

focusing on his school work. The challenge is that Simon has developed a primitive narrative that is getting in the way of him seeing a future for himself, which in turn affects his ability to be intrinsically motivated to complete his school work. Instead, he is barely staying afloat at school as he is driven to do the minimum amount of work to avoid getting his electronics taken away (e.g., extrinsic motivation) (Ryan & Deci, 2000; Deci & Ryan, 2008). Once the primitive narrative becomes active, it becomes a self-fulfilling prophecy in that the child will not register the positive experiences that do not fit his primitive narrative.

It is my clinical experience that most parents are not aware that this dynamic has been



The tendency for the child's brain to remember negative emotions results in the development of the primitive narrative which conceptualizes the child's place in the world as one of inadequacy, the perceptions of others as not to be trusted, and a sense that the future is not an attainable destination.

at play for a long time prior to the child's symptoms becoming visible and problematic. As the protocol assists parents to join with the child's internal world, the child starts to share his true feelings and memories regarding his childhood experiences at which point the parents are usually shocked about how much they did not know about the child's experiences. The protocol directly targets these primitive narratives through the delivery of relational neuro-narratives (The Science of Psychotherapy, 2019; Veliz, 2017) by the parent in order to upgrade the meaning of the child's early experiences.

### **Children's Symptoms Conceptualized as Self-Regulatory Challenges**

At the beginning of this century, researchers started to realize that symptoms being expressed by children were the result of the dysregulation of the central nervous system. For example, in 2005, referring to negative emotionality/difficult temperament, Belsky speculated that "negativity actually reflects a highly sensitive nervous system on which experience registers powerfully – negatively when not regulated by the caregiver but positively when coregulation occurs" (Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2007, p. 303).

Thus, regardless of the concept that is used to describe the challenges [e.g., Inhibited Dopamine Function (Farrell & Grey, 2018); Reward Deficiency Syndrome (Blum et al., 2012; Blum, Cull, Braveman, & Comings, 1996); Executive Function Dysfunction (Listig, 2017); Sensory Processing Sensitivity (Slagt, Dubas, van Aken, Ellis, & Dekovic, 2018); Hyperdopaminergic Syndrome (Previc, 2009)], the protocol conceptualizes behavioral and emotional challenges

as a result of a dysregulated stress-response system which is expressed as an inability to self-regulate. Self-regulation is "the ability to control inner states or responses with respect to thoughts, emotions, attention, and performance. As such, it is a critical aspect of development and fundamental to personality and behavioral adjustment... and includes biological components such as physiology, neurobiology, and genes, and situational components such as parenting, environment, and experience" (Bell & Deater-Deckard, 2007, p. 409). Self-regulation includes a myriad of biological processes such as neurotransmitter genes (e.g., serotonin and dopamine) along with central and peripheral nervous system networks including the prefrontal cortex and the limbic system (Bell & Deater-Deckard, 2007). Children will express their inability to self-regulate in different ways depending on the interaction between their genetic predispositions and the qualities of the caregiving environment. Some will display their symptoms in an externalizing and others in an internalizing way, while others display a blend of both.

After working with many children like Simon who were diagnosed with ADHD when they started elementary school, I have learned to conceptualize attention-deficit hyperactivity disorder (ADHD) as one of the many symptoms that point towards the child's inability to self-regulate. Joel Nigg, author of *Getting Ahead of ADHD* conceptualizes ADHD as "the extreme on a spectrum, in the same way that hypertension is the extreme on the continuum of blood pressure" (Nigg, 2017, p. 4). Thus, Simon's sensitivity – his insecurity, kindness, anxiety, oppositionality, defiance, creativity, and depressive feelings of inadequacy – all point to



his inability to self-regulate. The traditional treatment approach would assign multiple diagnoses to this presentation (e.g., oppositional defiant disorder, ADHD, generalized anxiety disorder, persistent depressive disorder), with each diagnosis having a recommended treatment which is what happened with Simon. However, while his caregivers were focused on fixing his behavior through techniques and coping skills, the broader understanding that Simon experiences the world differently from most kids was missed, and thus Simon's symptoms continued to escalate.

## RELATIONAL & DEVELOPMENTAL NEUROGENOMICS

### Differential Susceptibility to the Interaction Between Nature and Nurture

The treatment is guided by research expounded by the differential susceptibility theory (Belsky, 2013; Pluess, 2015; Pluess & Belsky, 2010; Belsky & van IJzendoorn, 2017; Pluess & Belsky, 2012, Belsky, Bakersmans-Kranenburg, van IJzendoorn, 2007; Belsky, 2016) which suggests that certain infants and toddlers who are



Sensitive children are burdened by the intensity of their ability to register input from the inside and outside, past and present, themselves and others. Thus, they require extra support from their parents to help them make sense of the immense amounts of stimuli they are able to detect but unable to process.

characterized as highly reactive (e.g., irritable, sensitive, fearful) or as having a difficult temperament are not only at risk for emotional, behavioral or cognitive challenges when exposed to adverse early environments (e.g., prenatal stress, maternal depression, harsh and punitive parenting), but are also most likely to benefit from positive and supportive (e.g., positive parenting, high quality childcare) nurturing experiences (Belsky, 2005; Belsky et al., 2007).

Boyce & Ellis (2005) also suggested a differential susceptibility to environmental care through their evolutionary-neurodevelopmental theory, referred to as the biological sensitivity to context framework which emphasized biological mechanisms (i.e., physiological reactivity) as an expression of the effect of nurture on development (Hartman & Belsky, 2018). Thomas Boyce, a pediatric epidemiologist, and his colleagues (Boyce, Alkon, Tschann, Chesney, & Alpert, 1995a) measured the effect of stress on two major stress response systems – the hypothalamic-pituitary-adrenal (HPA) axis and the locus coeruleus-norepinephrine system (Boyce, 2016). Research studies conducted over more than 30 years on various types of stressful conditions and their effect on mental health (e.g., presyndromal psychopathology; Obradovic et al., 2011) and physical health (e.g., respiratory illness; Boyce et al., 1995b) consistently showed that 15–20% of children (deemed highly reactive) were associated with the highest level of challenges when they were exposed to stressful conditions, yet they had the lowest levels of challenges in the absence of adverse conditions. Yet, the functioning of 80–85% of children which showed low to average reactivity was not affected regardless of the type of environmental exposure (Boyce, 2016). Boyce

coined the term “orchid” (Boyce, 2019, p. 11) to describe these children’s ability to thrive when exposed to supportive environments, while also having a tendency to quickly fall apart under conditions of adversity – both due to their higher levels of brain plasticity (Boyce, 2019). Boyce’s conceptualization of these sensitive children has guided my clinical work as most of my clients (youth and adults) fit this orchid conceptualization.

### **Epigenetic Processes as the Conduit for Differential Susceptibility**

Epigenetics refers to the process whereby “the environment ‘marks’ the genes, dramatically or subtly, changing their level of expression either transiently or for our lifetime, or, through inheritability, throughout our children’s and grandchildren’s lifetimes” (Peckham, 2013, p.10). Research findings pertaining to differential effects of the environment on children’s functioning regardless of whether negative emotionality, physiological reactivity or genetic markers are studied point to epigenetic processes as the conduit for differential susceptibility since “environmental influences are modulated by critical periods in development, when neurobiological circuitry is especially responsive to experience and plasticity is most accessible; the opening and closing of critical and sensitive periods are regulated by epigenetic events that guide the maturation of excitatory and inhibitory neural circuitry and the expression of molecular ‘breaks’ that reverse the brain’s inherent plasticity” (Boyce & Kobor, 2015, p. 16).

## Two Broad Types of Sensitive Children

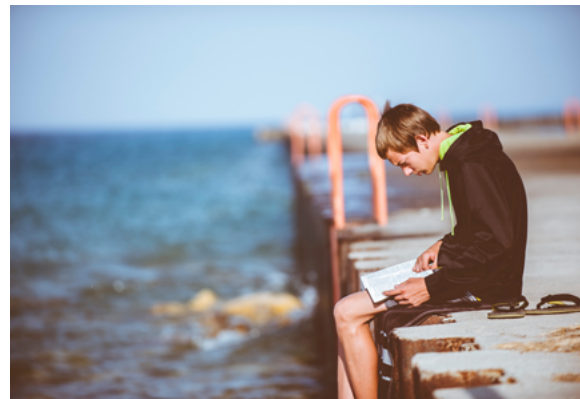
The most obvious of the two broad types of sensitive children are the hyperactive, impulsive, emotionally expressive children. They have tantrums and meltdowns; are sensitive to touch, light, and sounds; are more driven by the ventromedial dopaminergic system which is more connected with the limbic system, and thus are more likely to be diagnosed with ADHD and learning disorders. They are more aggressive, compulsive, and more prone to early and excessive sexual activity and addiction. I call this child the old soul type.

A sibling of the old soul type is the socially awkward, highly strategic, future oriented intellectual type who presents as unemotional and misses social cues, but is also suffering like the old soul type, yet because of their “calm and collected” presentation, parents are usually not aware that they are suffering. They have managed to suppress activation of their HPA under stressful conditions (Boyce &

Ellis, 2005, p. 280). They have a more active dorsolateral prefrontal cortex which is “associated more with the focal-extrapersonal brain pathways, is involved in planning and strategizing and provides a major inhibitory control over the intense drives of the ventromedial dopaminergic system” (Previc, 2009, p. 67). This type of personality presents with blunted emotional arousal due to the parasympathetic effect of dysregulated dorsolateral dopamine activity (Delaveau, Salgado-Pineda, Wicker, Micallef-Roll, & Blin, 2005). Thus, they exhibit the trait of emotional detachment which has been linked to high levels of dopamine and the dopamine receptor gene DRD2 (Breier et al., 1998). However, while these children might appear unemotional, they are actually quite sensitive inside. Some parents even worry that these children are exhibiting antisocial tendencies due to their lack of emotional display and empathy for others. For these children, the treatment that I suggest to parents is to not let these children fool them into believ-



a) Old Soul Type



b) Intellectual Type

There are two broad types of highly reactive (i.e., orchid) children. Both are sensitive, intelligent, creative, and struggling even when caregivers are not aware of it. The old soul type is more driven by the ventromedial dopaminergic system, and is therefore more likely to be diagnosed with ADHD, mood and learning disorders. The intellectual type does not have tantrums as they are able to blunt emotional arousal due to dysregulated dorsolateral dopamine activity (Previc, 2009; Delaveau, Salgado-Pineda, Wicker, Micallef-Roll, & Blin, 2005).

ing that they are not emotional, not empathic, or that they don't need emotional connection and expression in their lives. I encourage parents to be overtly emotionally expressive and physically affective with these children. While they initially feel uncomfortable because little-by-little they had conditioned the parent to not engage in displays of affection with them, they eventually "come back to life" and start asking for more emotional engagement.

The protocol conceptualizes Simon as an old soul type (i.e., orchid child) who is unable to function in the traditional environment and with traditional expectations. For children like Simon, rules, consequences, and any fear-based "carrot and stick" approach won't help them increase their ability to self-regulate. Instead, these traditional parenting approaches end up upregulating the child's stress response system and causing more behavioral and emo-

tional challenges. When I share this way of conceptualizing the child's challenges, mothers usually communicate that they knew there was something different about their child that they did not quite understand, and that the differential susceptibility theory was helpful in understanding their child's challenges (i.e., highly sensitive stress response system) instead of just looking at the expression of the challenges (e.g., disrespect, defiance, laziness).

## TREATMENT GOALS

The treatment supports the strengthening of self-regulatory neural networks (Baylin & Hughes, 2016) while nurturing a healthy balance between the "here and now" (H&N) neurochemicals and dopamine levels (Lieberman & Long, 2018).



**a) Social Reward - Here & Now Neurochemicals**



**b) Drug Reward - Dopamine**

When parents are able to provide pleasurable experiences that upregulate the social engagement system and downregulate the social defense system, the child will know the difference between pleasure resulting from the release of oxytocin, serotonin and endorphins during "here and now" (p. xvi) interactions as compared to the pleasure that results from extrapersonal dopaminergic pursuits (e.g., drug reward) (Lieberman & Long, 2018).



### Neural Networks

The goal of the interventions suggested by the protocol is enhanced executive functioning by transitioning the child from social defense to social engagement (Baylin & Hughes, 2016) by targeting to downregulate the stress response system as only then the child is able to “take in” the beneficial effects of his interactions with parents while enhancing the release of oxytocin as a way to soothe the amygdala. When these soothing interactions between parent and child do not include consequences, and instead focus on the establishment of safety and joining with the child’s emotional state, the child’s self-regulatory system starts to transition from being mostly controlled by the amygdala to being highly influenced by the VMPFC which allows the child to use his default mode network to “support the development of reflective functioning and the process of reappraising old, self-referential learning in the light of new experiences” (Baylin & Hughes, 2016, p. 22). Parents are then able to use their soothing presence to assist the child to slowly upgrade his primitive life narratives through the process of memory reconsolidation. This process allows the hippocampus to provide time and context to negative childhood memories that the child was unable to fully experience and process in the past (Rossouw, 2015).

### Harmony Between Oxytocin and Dopamine

Oxytocin in addition to the other “here and now” (Lieberman & Long, 2018, p. xvi) neurochemicals (e.g., serotonin and endorphins) allows us to enjoy what is right in front of us: The so-called peripheral space which represents the only thing that is real “right here right now.”

If children are not able to feel pleasure in enjoying the here and now which is more related to deep human connections that activate the social engagement system and downregulate the self-defense system through the release of oxytocin, serotonin and endorphins they will eventually chase after the pleasures that can be achieved in the extrapersonal: A world of future pleasures and possibilities which is more dopaminergically driven, self-serving, and logical at the expense of relational and emotional dynamics (Lieberman & Long, 2018).

The crown jewel of the dyadic treatment advanced by the protocol comes from the positive effects that oxytocin has on the self-regulatory system of both parent and child because “oxytocin stimulates dopamine production and interacts with dopamine to enhance the reward value of a significant other” (Cozolino, 2014b, p. 123), and “oxytocin also blocks dopamine receptors to prevent habituation to those we love” (Cozolino, 2014b, p. 123). In essence, the oxytocin system is positioned to interact, inhibit, and/or stimulate other critical self-regulatory systems including the HPA-axis, the immune system, the dopamine reward system, the serotonin system, and the vagus nerve resulting in increases in resilience by “reducing drug reward, increasing social reward, reducing anxiety, reducing stress response and immune stimulation” (Buisman-Pijlman, Sumracki, Gordon, Carter, & Tops, 2014, p. 34).

When oxytocin and dopamine are produced together during relational interactions between parent and child, the child will be able to know the difference between this type of “relational” pleasure and the “transactional” pleasure that they might get from engaging in activities

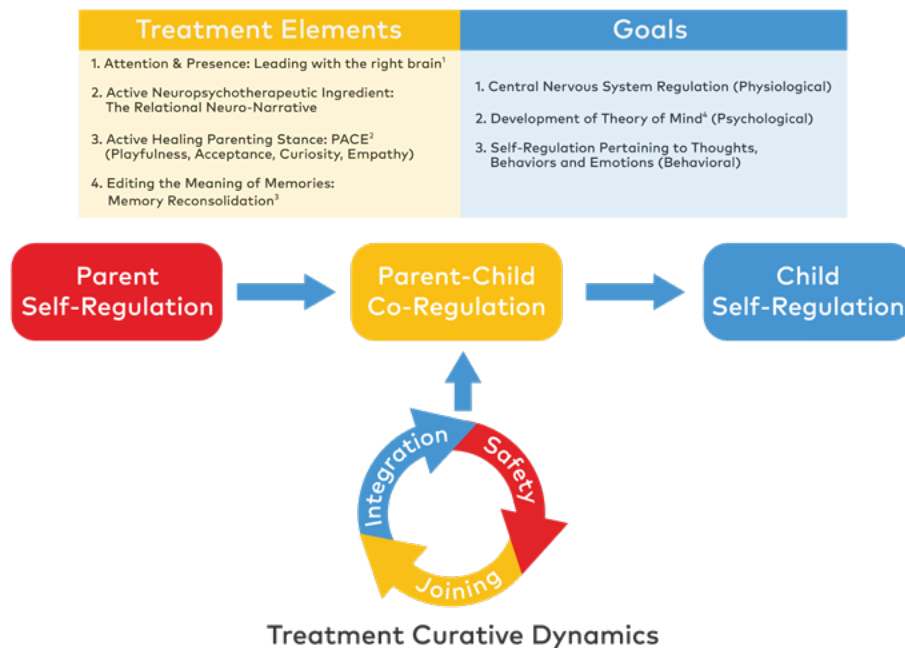
that only increase dopamine such as using substances, playing video games, and engaging in behaviors that result in high levels of excitement. In other words, through high levels of relational bonding with their parents, children learn that while there are many things that will “feel good,” connecting with people they love feels better. This is critical for the child to build a life in which he knows the neurochemical difference between deep human connections, and the temporary excitement from high thrill activities.

Unfortunately, many children are not exposed to enough relational interactions with

their parents. Thus, they seek to self-medicate through activities that promote the release of dopamine since “when people find others to be ‘unrewarding,’ they may become more likely to seek alternative rewards. Money, status, objects, .... or even the exquisite suffering involved in self-harm can be conditioned to activate pleasurable centers. The problem is, when you depend on a substitute for love, you can never get enough” (Cozolino, 2014b, p. 126).

However, it is clear that the neurobiologically informed approach suggested by the protocol is counterintuitive to most caregivers as the traditional approach attempts to force,

## The Parent-Child Neuropsychotherapy Protocol™



1. **Safety:** The relationship between the parent and the child trumps everything else – with the only exception being anyone’s physical safety.

2. **Joining:** In order to maintain the relationship, the parent connects with the child’s behavior, feelings, and inadequacies instead of attempting to correct or fix them.

3. **Integration:** Safety and joining results in the child’s ability to have empathy for other people.

<sup>1</sup>McGilchrist, 2019; <sup>2</sup>Hughes, 2009; <sup>3</sup>Ecker, Ticic, & Hulley, 2013; <sup>4</sup>Premack & Woodruff, 1978

Summary of the treatment stages, elements, goals, and curative dynamics of The Parent-Child Neuropsychotherapy Protocol™.

tell, or direct the child to change their behavior which results in the child feeling misunderstood, controlled, and punished leading to enhanced dopamine-driven survival-based behaviors (Wenzel et al., 2018).

## TREATMENT STAGES

### Stage #1: Parent Self-Regulation

My work with parents is a combination of information sharing pertaining to their children's history and challenges, highly targeted individual therapy, neuropsychoeeducation focused on the healthy development and functioning of children's brains, and parent coaching. This process attempts to eliminate the state of "blocked care" (Hughes & Baylin, 2012, p. 82), and results in parents recognizing how their own unacknowledged and unintegrated experiences are getting in the way of understanding and speaking the language of "neurobiological safety" in order to usher the child towards the dynamics of relational love. In other words, if parents are not able to have empathy for their own emotional history, they will most likely be unable to have empathy for the emotional dynamics pertaining to important people in their lives including their children and spouses. The parent's ability to present a self-regulated approach-oriented stance when deploying therapeutic parenting interventions is critical as the child's amygdala is extremely sensitive to the non-verbal communication features expressed by the face muscles (Coan, 2010).

Simon's mother realized that while she did not agree with her husband's parenting approach, she was not able to understand how her

fears of not being a good mother were getting in the way of advocating for Simon's needs. Instead she would become numb, and let her husband use an authoritarian consequence-based parenting style which resulted in Simon's behavior escalating. While Simon's father was a successful business man and conducted himself as always being in control, he started to realize that Simon had become an immense trigger for him. He eventually confessed that Simon's behaviors reminded him of when he was Simon's age. He eventually sobbed uncontrollably as he recounted many bullying incidents from his childhood that he had suppressed. He mentioned that he was also very creative and artistic like Simon, but thought that boys needed to be tough and have careers in engineering and business which is the path that he took. He acknowledged that while he had done very well financially, he was not happy with his life, and he constantly fantasized about being able to dedicate time to artistic pursuits. He admitted that his anger was not about Simon. Instead, it was clear that who Simon was turning out to be was a reminder of the pain that he endured when he was a child. There was even a sense of resentment that would come up as father considered the possibility that he would be able to provide the encouragement that Simon required because this would remind him of what he did not get from his parents. Yet, at the same time, he wanted to help his son to have the sense of fulfillment that he didn't have.

It is this type of very targeted individual psychotherapy that is conducted to help the parent self-regulate, that is critical to the protocol. And for Simon's father, his capacity to self-regulate improved when he was able to acknowledge, process, and most importantly



During the first stage of treatment, the therapist assists parents to self-regulate by eliminating “blocked care” (Hughes & Baylin, 2012) in order for the parent to be in a position to support the child to build neural networks of approach which will lead the child towards wellness and resilience (Rossouw, 2015).

integrate these painful childhood memories so that they were not in the way of him feeling Simon’s pain as Simon’s rather than as his own unprocessed pain. It was only then that father was able to provide the therapeutic brain-based parenting support that Simon needed.

Through our work together, Simon’s father

understood how he would quickly become authoritarian when situations touched on unresolved experiences from his past which made him feel inadequate. While he had initially told me that he felt this relational approach did not have enough “teeth,” he was humbled to realize that strength was not about avoiding pain, but about embracing it. This was a very coun-



terintuitive realization, yet critical for the success of the treatment.

Once a parent is able to have this awareness, not only are they ready to “take in” and make use of the neuropsychoeeducation and therapeutic parenting techniques, but they are able to deploy them in a way that will be leading with the right-brain (McGilchrist, 2009, 2019). The individual sessions with Simon’s father resulted in an awareness of a critical issue that was not about Simon’s behavior, but instead about the meaning that this behavior had for Simon’s father. This awareness allowed father’s parenting approach to switch from a top-down (e.g., “You are a bad child, and I am going to tell you how to change your negative behavior”) to bottom-up (e.g., “I feel your pain, I can relate with what you are feeling, and I am going to walk by your side as we solve this together because there is nothing wrong with you.”)

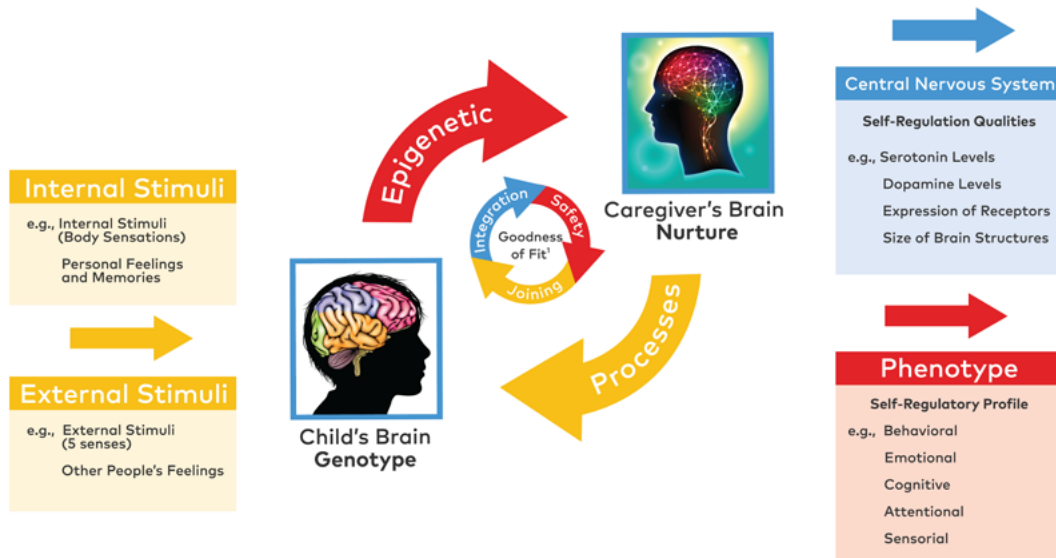
In this case, I chose to first focus on Simon’s father as his authoritarian reaction was getting in the way of mother following her gut pertaining to providing the additional support that Simon needed, and was also negatively affecting their marriage. Parents very quickly acknowledge that the protocol is not only targeting the child’s challenges. As father started to realize how Simon had been triggering him, he also started to see how his sensitivity had been showing up in other areas of his life including his personal and professional relationships. I then conducted several conjoint sessions with Simon’s parents in which I provided the therapeutic space for father to accept how his behavior had been negatively affecting not only Simon’s development, but also the dynamics of their marriage. With a stronger parental al-

liance, I then proceeded to meet individually with each parent to provide them with parenting techniques that they could use to begin to repair their relationship with Simon while providing the co-regulation that Simon so desperately needed from his parents.

## **Stage #2: Parent-Child Co-Regulation**

Once the parents are engaged in the therapeutic process, I move to help them apply the same approach used to help connect their anger towards their child to their early feelings and memories to coach the parent on how to help the child make connections between the behaviors that had been getting the child in trouble, and the emotions and thoughts that might be associated with those behaviors. As the treatment shifts towards the parents starting to share their enhanced self-regulatory capabilities with the child, the sessions with parents start to also include the provision of very specific relational neuropsychotherapeutic interventions that provides a template for parents to practice with their children what they have been learning in their sessions. I then provide feedback on how the child might have actively derailed the parent’s capacity to self-regulate, and provide suggestions for future therapeutic parenting opportunities. I usually witness a sort of “parallel healing” for the entire family. In most cases, parents that came in highly dysregulated are able to apply the relational parenting techniques after a few sessions, and soon the parents start to focus more on their own individual and conjoint treatment as they start to become more comfortable with their ability to support their children by using the protocol.

## Child's Self-Regulatory Capabilities



Adapted from Pluess (2015) – Neurosensitivity Hypothesis  
Grobstein (2009)

Children receive internal and external stimuli. The “goodness of fit” (Grobstein, 2019, para. 18) between the support and care that the child needs in order to manage the stimuli, and what the parents are able to provide results in the child’s central nervous system self-regulatory qualities which are expressed as the child’s phenotype. This developmental dynamic is regulated by epigenetic processes (Boyce & Kobor, 2015).

Interventions designed to provide safety while joining with the child are deployed by the parent at the beginning of treatment. Eventually, interventions build momentum and result in the parent providing co-regulation through integration by activating default mode network processes leading to the child having the ability to care for other people.

### Stage #3: Child Self-Regulation

The interventions included in the protocol deployed by relational neuro-narratives which focus on understanding what are the primitive

narratives that are being expressed through the child’s emotional, behavioral, cognitive, sensorial, and attentional challenges while down-regulating the child’s stress response system result in the eventual ability for the child to self-regulate as the executive control transitions from the amygdala to the VMPFC (Baylin & Hughes, 2016).

The child’s self-regulation is the result of a high level of “goodness of fit” (Grobstein, 2009, para. 18) between the child’s genetic information (i.e., genotype) and their early life environment (e.g., nurture), which depends on the parents’ capacity to self-regulate.

## TREATMENT ELEMENTS

### Attention and Presence: Leading with the Right Brain

The way in which we “take in” and process the world [e.g., the way we attend (McGilchrist, 2019); “attention and presence” (Tatkin, 2017, p. 29)] is critical to the efficacy of the protocol. Early in the treatment, I show parents that the way in which they are choosing to live is

critical to the amelioration of their relationship challenges not only with other people, but also with themselves. The protocol was inspired by the work of Iain McGilchrist (2009, 2019) who describes in detail how we have progressed towards creating a society that leads with the left side of the brain. This way of attending has resulted in unprecedented technological advances while eroding our ability to experience a more “integrated, empathic, relational, and embod-

## Relational Neuro-Narrative™ Components

1

Determine the developmental themes and associated emotional states that the child might be struggling with which might result in the development of primitive narratives.

2

Acknowledge the challenging behavior and help the child understand the emotions and memories that might be motivating the behavior.

3

Assist the child to connect his current challenging behavior with stressful past relational experiences related to developmental themes that the child is struggling with.

4

Validate the child's behavior by looking at the situation from the child's perspective which takes into account the primitive nature of the child's brain.

5

Apologize and take responsibility for the child's exposure to early relational stress in order to unburden the child from feelings of shame, guilt, and overall “badness.”

6

Instill hope in the child by reassuring the child that things are now different because the parent is aware of and understands the child's emotions.

ied sense of relationship” (McGilchrist, 2019, p. xi). When we lead with the left-brain we tend to be very “matter of fact,” logical, black or white, cause and effect focused, and linear. While these thinking patterns work great in the business world, they are quite problematic in the world of relationships.

The nature of reality becomes more complicated when we take into account that most of the processes that cause relational challenges are caused by unacknowledged, unprocessed and unintegrated memories which motivate our current responses as the brain operates automatically and defaults to a negative bias “toward picking up internal cues as well as cues from the environment that it considers dangerous” (Tatkin, 2017, p. 26). Thus, the protocol provides a template for parents to understand that in most cases the anger that they are feeling towards a child or spouse is the result of the triggering of an older unintegrated memory as their child and/or spouse are not “that important” when it comes to the development of the relational dynamics of the brain (i.e., the right brain) which happens during the early years of life in the context of attachment relationships with primary caregivers (Schore, 2003a, 2003b).

#### **Active Neuropsychotherapeutic Ingredient: The Relational Neuro-Narrative™**

The relational neuro-narrative is an intervention through which the parent downregulates the child’s limbic system, while improving the parent-child relationship as a way to move the child from avoidance to approach patterns of behavior to improve wellness and resilience (Rossouw, 2015). In essence, relational neuro-narratives operationalize the neuropsychoth-

erapeutic ingredients which allow the parent to assist the child to shift from bottoms-up survival mental loops to top-down thriving mental loops (Rossouw, 2014) with the parent as the facilitator of this shift.

By using relational neuro-narratives the parent assists the child to learn how to integrate all aspects of his life (e.g., good and bad; past, present and future; anger, happiness and sadness; self and other; love and hate), and to experience and express the entire realm of human emotions. Relational neuro-narratives attempt to equip the child with a cohesive narrative of his life story which is the most consistent predictor of adult attachment security (Siegel, 2012) by helping the child to understand the interconnection between his feelings, thoughts and behaviors.

The six components of the protocol’s relational neuro-narrative are:

1. Determine the developmental themes and associated emotional states that the child might be struggling with which might result in the development of primitive narratives.
2. Acknowledge the challenging behavior and help the child understand the emotions and memories that might be motivating the behavior.
3. Assist the child to connect his current challenging behavior with stressful past relational experiences related to developmental themes that the child is struggling with.
4. Validate the child’s behavior by looking



at the situation from the child's perspective which takes into account the primitive nature of the child's brain.

5. Apologize and take responsibility for the child's exposure to early relational stress in order to unburden the child from feelings of shame, guilt, and overall "badness."
6. Instill hope in the child by reassuring the child that things are now different because the parent is aware of and understands the child's emotions.

Relational neuro-narratives can be used right after a particular interaction or after the event has taken place. It is better for them to be short and tentative (e.g., "maybe...") statements that do not include questions. This intervention works best when it is followed by the parent walking away or changing the conversation in order for the child to be able to take the narrative in, and not feel compelled to respond. These narratives are designed to be one-way communications from the parent to the child instead of a back and forth conversation. Since they include tentative material (e.g., "it is possible that you were angry at me because I have been working late all this week, and have not had time to help you with your homework"), the child might correct the parent and provide information that the parent was not aware of. Relational neuro-narratives are designed to target implicit memory processes (e.g., primitive narratives), and therefore the effects will not be evident right away. Finally, how the child reacts to the narratives is not an indication of the effectiveness of the intervention. For example, due to the intimate

"right-brain-to-right-brain (Schoore, 2012, p. 7) communication design of the intervention, some children might not be used to this level of closeness, and might even initially get angry at the parent.

The goal of using relational neuro-narratives is to help jump start the child's self-reflection capabilities which involves the development of the prefrontal cortex (Baylin & Hughes, 2016). This intervention is designed to communicate to the child that the parent understands that there is something that is not right with the child, and that it is not the child's fault. Yes, most importantly, that the parent is joining the child in trying to figure out what primitive narrative might be getting in the way of the child's functioning.

Relational neuro-narratives attempt to transition the child's "biobehavioral programs" (Tops, Luu, Boksem, & Tucker, 2013b, p. 15) from those that are driven by ventral corticolimbic control pathways "including the amygdala, inferior frontal gyrus, anterior insula, and areas of the anterior cingulate cortex" (Tops, Buisman-Pijlman, & Carter, 2013a, p. 116) which are fast acting and function best in unpredictable environments to those that are driven by dorsal corticolimbic control pathways "including posterior cingulate cortex, precuneus, posterior hippocampus, and dorsolateral prefrontal cortex" (Tops et al., 2013a, p. 116) which are designed for more slow learning and are adaptive for highly predictable environments. Reactive systems are emotionally focused, whereas when slow processing "context models" (Tops et al., 2013b, p. 15) exert control of behavior, emotional context is not as salient resulting in higher levels of resilience (Tops et

al., 2013b). These context models can also be called internal working models as they organize the child's sense of self and worth in the context of his important relationships. Critical to the development of the future resilience of the child, when his behavior is driven by internal working models, his emotional experience is not limited to being concerned about the present, instead "it has a wider temporal focus that produces self-awareness and a sense of the past and the future. Moreover, the successful internal working models that are shaped and used in prospective control, will tend to include representations of positive experiences and outcomes. This positive bias and the less intense emotions enable active coping through confronting both negative and positive affects" (Tops et al., 2013a, p. 116).

I helped Simon's parents to identify a few developmental themes that could be addressed while using relational neuro-narratives. A very common developmental theme whose effects is usually downplayed by parents is what I call "dethronement" – when the birth of a new baby results in the first-born transitioning to not being the center of attention of the household. Many children are able to verbalize their rage pertaining to this event in my office. In many cases parents are shocked when they understand that the negative behavioral dynamics between siblings are much deeper and complicated than the so-called "sibling rivalry."

In many cases, these developmental themes become layered with each one making the other one worse. Simon had not only resented his brother for having taken away his parent's undivided love and attention, but his brother was turning out to be just like his father. Thus, his

feelings of rejection and inadequacy had become intensified. One thing was for Simon to not be able to be athletic like his father while being constantly criticized for it. However, it was more painful for Simon to see how his father connected flawlessly with his brother. The effect that these developmental themes had on Simon's primitive narrative was devastating. Simon believed that he was "good for nothing," and at times worried that maybe he was "not man enough" because he was constantly called a sissy by other boys, and because he did not fit the image of what it was to be a man – an image perpetuated by the media, and emphasized by his father and brother. What was ironic about this masculinity dynamic in the family was that Simon's father eventually confessed that he had never really liked sports when he was younger, but he felt that he needed to become athletic and stop pursuing artistic and creative projects otherwise his friends would think he was not a real man.

### Active Healing Parenting Stance: PACE

The protocol uses the concept of PACE (Hughes, 2009) as the active healing parenting stance. PACE is a relational approach that engages children with a *playful* stance, is *accepting* of the child's current dysregulated state, is *curious* about the child's internal emotional world (without judgment, trying to fix him, or make suggestions for improvement), and is *empathic* for the child's current emotional experience (Hughes, 2009, 2011). The protocol follows Jonathan Baylin's conceptualization of PACE as a "formula for epigenetic reprogramming of the child's neuroceptive system" (Baylin, 2013, p. 76). The target for the parenting

interventions focus on the genes responsible for the neurotransmitters that affect self-regulatory processes including the functioning of the amygdala, hippocampus, and the prefrontal cortex (Baylin, 2013). In addition, the state of safety and relaxation resulting from the PACE stance results in “increased integration and connectivity between higher and lower right brain” (Peckham, 2014, p. 83) as this is the key component of a secure attachment (Siegel, 2012).

Simon’s father stated that one of the biggest sources of daily friction with Simon was when it was time for Simon to stop using electronics to get ready for bed. I suggested that this challenge would be a great opportunity to illustrate how to use PACE to deploy the interventions that father was learning in order to enhance his relationship with Simon which in turn would result in the desired behavioral change. One night, father asked Simon if he could sit right next to him while Simon was on his phone right



The meaning of the child’s painful memories can be upgraded through the process of memory re-consolidation by the parent reacting differently to the way the child was expecting (Ecker, Ticic, & Hulley, 2012, 2013) while helping the child process painful early life memories through the use of relational neuro-narratives.

before bedtime. Father then asked Simon if he could help father understand all the different social media apps that Simon was simultaneously using to communicate with his friends. Initially, Simon appeared to ignore his father's attempts to engage with him, and then abruptly told him to go away. Father (pretending like he had seen Simon's phone) then said: "Ohhh snap! You have two different girlfriends? And they know each other? OMG LMAO." This was designed to catch his attention, to be playful and funny and to result in Simon making a comment regarding all the different topics that were addressed by father's statement (e.g., his father using teenage slang, reference to two girlfriends which father made up to get Simon's attention, and father's use of text acronyms).

This intervention was intended to give Simon the opportunity to be in control as his father was venturing into Simon's internal world – a world in which Simon was an expert and his very smart, successful, and authoritarian father wasn't. As Simon asserted his leadership and shared his opinions about his father's cluelessness, Simon started to enjoy this interaction and slowly transitioned from criticizing to instructing his father. Along the way, Simon shared with his father that he wished he had a shot at girls finding him attractive which gave father new information, and the opportunity to empathize while accepting that this is where Simon was in his development. Eventually, father acknowledged that he had never thought much about how important social media was in Simon's life, and that instead he had only focused on just enforcing the rules every night. Father also asked Simon if there could be a way for father to not have to be too forceful with Simon prior to his bed time, as he would prefer to

engage with Simon in the way that he had engaged just now, instead of being on him about turning off his phone. Simon stated that he would like that as well. Simon's father started to join Simon every night to chat about his day in a way that Simon started to look forward to.

It is important to emphasize that the goal of this intervention was not about behavioral change. Instead, it was to turn a behavioral challenge into an opportunity to strengthen father's relationship with Simon. It is my clinical experience that when this happens, children are more willing to follow the rules even if they don't like them.

#### **Editing the Meaning of Memories: Memory Reconsolidation**

The protocol focuses on engaging the child on new experiences that can alter the current patterns of gene activity that are directing the child's current self-defense avoidant patterns of living resulting in "environmental enrichment" (Baylin, 2013, p. 75). This new way of relating to the child will signal to the child's brain that there is some information that is different from what the child expected. This "prediction error" (Baylin & Hughes, 2016, p. 103; Schultz, 2016) creates an opportunity for the process of memory reconsolidation to take place. During this process, the child's painful memories are reactivated and a different interpretation is presented by providing context that the child was unable to create on his own when the early life stressful experiences took place. This process of environmental enrichment through the co-regulation action of safety, joining and integration leads to an upgrade to the meaning of the child's painful memo-



ries as a result of this new learning experience (Ecker, Ticic, & Hulley, 2012, 2013).

This is important because, “it is this right-lateralized, non-verbal, implicit yet highly meaning-making memories of this type that shape foundational understanding of self and the world and determines how we anticipate the future” (Dahlitz, 2015, p. 52), and these primitive narratives usually get in the way of the parent being able to provide the support and understanding (i.e., co-regulation) that the child needs. In addition, this envi-

ronmental enrichment results in an epigenetic process as these “novel experiences with caregivers can trigger the process of tagging brain cells for future gene expression, a process involving what are called Immediate Early Genes” (Baylin, 2013, p. 75). However, in order to ensure the proper development and modification of the neural processes responsible for self-regulation, “the child needs to be protected from intense, prolonged, and overwhelming affective states. In one sense, a child ‘borrows’ the prefrontal cortex of the parent while modeling the development of its own nascent brain on what is borrowed. Emotionally stimulating interactions generate brain growth, whereas dysregulated affect and prolonged stress results in neuron loss throughout cortical-limbic circuits” (Cozolino, 2014a, p. 45).

I guided Simon’s father to use relational neuro-narratives to edit the meaning of the memories that Simon had encoded pertaining to the many times that father had blatantly shamed Simon for being afraid of being hit by the baseball, and when he would fall playing soccer and cry in front of his teammates when he was younger. Father told Simon that he wanted to apologize for the way that he had treated him throughout his childhood. Father proceeded to recount in detail several situations that had caused father to become very upset with Simon. Father could see a mixture of fear and shame in Simon’s eyes as Simon had been transported to a painful time in his past. Father told him that it had taken him a while to realize how cruel it had been for father to force Simon to engage in sports activities when it was clear to him that Simon wanted to be alone in his room making elaborate works of arts with colored paper and tape. Father apologized



### Safety:

- Floor time<sup>1</sup>
- Relational Consequences
- Time-in instead of time-out
- 3Rs (do not retreat, react, or retaliate)<sup>2</sup>
- Safe touch<sup>3</sup>

### Joining:

- Story voice and story telling<sup>4</sup>
- Attunement, misattunement, and repair
- Engage in play and laughing out loud<sup>5</sup>
- Engage in rhythmic interactions<sup>6</sup>
- Wooing the child<sup>7</sup>

### Integration:

- Exercise & hands-on projects<sup>8</sup>
- Activation of default mode network

<sup>1</sup> Greenspan & Salmon, 1995; <sup>2</sup> Axelman & Shapiro, 2012; <sup>3</sup> Baylin & Hughes, 2016; <sup>4</sup> Baylin & Hughes, 2016; <sup>5</sup> Baylin & Hughes, 2016; <sup>6</sup> Perry, 2006; <sup>7</sup> Mate, 1999; <sup>8</sup> Lieberman & Long, 2018

Summary of the parent-child co-regulation interventions.

for not appreciating and instead discarding Simon's inherent talents. Father stated that he wanted to encourage Simon to further pursue his creative interests as father wanted to make up for having ignored Simon's interests in the past. This exchange provided the three ingredients for effective memory reconsolidation including reactivation of the original memory; a mismatch in the expected result of experiencing the memory along with a new learning experience within five hours (Ecker, Ticic, & Hulley, 2012, 2013) as father was not critical, and instead was apologetic and willing to make up for having had a negative effect on Simon's life course and self-esteem.

Part 2 will continue introducing the protocol by focusing on the curative dynamics including detailed interventions that use safety, joining, and integration to ensure the child's physiological feelings of safety through the downregulation of his stress response system in order to enhance this ability to self-regulate on his own.



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## THE LAST WORD



# THE QUANTUM COMMUNICATION INFORMATION WORLD WE LIVE IN NOW

by  
**Ernest Rossi**

July 2019



Psychology requires a place at the table of current research funding particularly in the burgeoning Quantum Information Science & Technology portfolio.

To answer Richard Hill's query, "Where To Now?", we need look no further than the current article in *Science* (Monroe, Raymer & Taylor, 2019 – May 3) that addresses the new "U.S. National Quantum Initiative: From Act to Action". The authors explain as follows:

"Although quantum information science and technology (QIST) is based on fundamental physical tenets familiar to many in the academic world, it remains alien to much of the industrial and engineering workforce that will actually build reliable quantum devices. Industrial investment in QIST has

grown considerably in recent years, but the field is at an embryonic stage, and formidable technical challenges to building quantum technologies remain. This confluence of opportunity, need, and challenge suggests that governments will have a substantial role in developing QIST and its ecosystem and in translating the corresponding science and technology for the benefit of society. We outline one such initiative, the U.S. National Quantum Initiative (NQI), and discuss how it can play a vital role in advancing QIST..."

## FROM BITS TO QUBITS

The authors explain that quantum information science is looking to develop “... new forms of information processing systems, spanning three broad categories: sensing, computing (including simulation), and networking.” There is already good science providing insights into nature from complex interacting systems to black holes. There are also practical technological developments including atomic clocks, advanced laser interferometers, and nuclear magnetic resonance. They describe that as an indication “that continuing development of quantum technology may usher great scientific opportunities in many other areas. Just as the LIGO (Laser Interferometer Gravitational-Wave Observatory) gravitational wave detector enables scientists to peer into the cosmos with new eyes, quantum technology opens windows into a realm governed by the laws of quantum physics, quantum computers will advance fundamental science by providing computing power to simulate a host of currently intractable problems...” Indeed, the National Science Foundation has announced a variety of new opportunities, including the establishment of Quantum Leap Challenge Institutes: “This rapid growth of programs turns the challenge back to the research community to drive forward the basic science. At the same time, building connections between governmental, academic, and industrial stakeholders—ranging from front-line researchers to teams building functioning quantum devices to end-user businesses and individuals—will help realize the opportunities QIST can provide.”

The authors urge the scientific community and these important stakeholders to “main-

taining open discussion... to help mitigate (the) many challenges, from growing workforce needs to better economic forecasting to solving scientific problems. These conversations, in turn, can reduce fragmentation of research efforts, improve investor decision-making and risk evaluation, and promote the innovation cycle of research driving products, which in turn drives revenue, leading to more research investment.”

The unfortunate aspect of this timely article is that nowhere does it even hint about the concerns of psychology in general, or the science of psychotherapy in particular. How shall we inform the authors of this article and the relevant players in the development of the Quantum Leap Challenge Institutes of the importance of including the human experience in these seemingly tech-heavy plans?

Psychology requires a place at the table of current research funding particularly in the burgeoning QIST portfolio. The Appendix 2 in our book (Hill & Rossi, 2017) presents, in part, a case for the ways in which quantum physics and quantum mechanics might provide the clearest understanding of what it is that happens within our client during the process of therapeutic recovery. We still do not have a reliable “Theory of Psychotherapy” that can excite scientists and therapists alike as to the current sense of, and future possibilities of, the therapeutic profession. A quantum understanding of therapy may extend to all forms of beneficial change in humans and other living creatures. Quantum computing may provide answers to questions that were once impossible to calculate, which may then stimulate questions that we do not yet know can be asked.

This expansiveness is going to occur in many aspects of STEM (science, technology, engineering and math) thinking and research. I strongly encourage the inclusion of psychology, psychotherapy and therapeutic practices in general, into this exciting program of research and discovery. I hope that the health and well-being of the human race is treated with the same importance as technology and commercial development and therefore, deserving of inclusion in the National Quantum Initiative.

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