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From WWII with Compassion

The Calatonia® somatic approach for global reorganization and mutual regulation of soma and psyche

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ABSTRACT

Calatonia is a somatic approach based on reinstating self-regulated states, developed by Pethö Sándor, a Hungarian physician, during WWII in the various refugee camps he worked as a doctor for the Red Cross. Initially a trauma-based approach, it was later incorporated into psychotherapy treatments in Brazil, where Sándor settled in the 1950s. This article intends to bring attention to this technique for research and use in current global war adversities and refugee displacement situations.

Keywords: dyadic regulation, affective and discriminative afferent systems, Default Mode Network, Orienting Reflex

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> ***... by using sustained bilateral stimulation, Calatonia activates and restores inter-hemispheric processing for supporting higher-order cognitive processes.***

Political conflicts and wars create a temporal group cohesion around a struggle for survival and subjugation of another human group, in which, as Audergon (2004, p. 18) describes, *"burnout and depression may be pervasive at social, economic, psychological and spiritual levels,"* potentially leading to a collective trauma of intergenerational repercussions (Hübl & Avritt, 2020). This narrow cohesion denies identification with the broader spectrum of human connections, built throughout human history, based on positive exchanges, mutual support, love, celebrations, and acceptance of differences, in which conflicts continually manifest themselves at manageable levels of collective coexistence. Having group identification at the most primary survival levels erodes the sense of individual safety based on belonging to a vast, peaceful collective. From a psychological perspective, recovery from pervasive war adversities and separateness may require rehabilitating trust in others at the most primary levels, that of experiencing regulated states in the presence of another (dyadic regulation retraining).

During WWII, the Calatonia technique arose out of sheer necessity and physical and psychological pain. It was probably the first somatic therapy

developed from and for those suffering war adversities and various trauma levels. Calatonia was described in an academic journal (Sándor, 1969) before war trauma symptomatology was identified as it is presently known (Turnbull, 1998). This technique was created by a Hungarian physician, Pethö Sándor (Kirsch, 2000), who worked in the Red Cross refugee camps in 1945, and in German hospitals following the war's end.

Sándor developed Calatonia while working with general infirmary patients of refugee camps, where he treated many different post-operative cases ranging from patients with phantom limbs and suffering from a nervous breakdown to depression and compulsive reactions, among other medical and mental health issues.

The expression Calatonia, in the original Greek *Khalaó*, means a "good or nice tonicity." However, its broader reference indicates "relaxation and feeding; retreating from a state of anger, fury, or violence; opening a door; untying the bindings of a waterskin; letting go; forgiving one's parents; lifting all veils from the eyes" (Sándor, 1969, p. 92).

This article briefly addresses the history of the Calatonia technique. It lists its modern-day neuroscientific hypotheses, formulated with the findings from research on skin receptors and brain imaging studies of the past twenty years. These hypotheses are supported by contrasting the findings of neuroscience research and clinical observation and research on Calatonia, although more empirical research would be needed to ascertain them.

Hopefully, this article will give the reader an idea of the breadth of application of Calatonia (and other Subtle Touch techniques) in the context of the treatment of war trauma and somatic psychotherapy as well, among other applications in related areas of health and well-being, to name a few, physiotherapy, speech therapy, nursing.

Brief History

In addition to the scarcity of resources, three other reasons led Sándor to explore the potential of therapeutic touch during and after the war.

1. Most patients did not wish to engage or cooperate with available methods, such as the progressive muscle relaxation of Edmund Jacobson (1888-1983) and the autogenic training of Johannes Schultz (1884–1970), which required active engagement at physical and cognitive levels. Refugees were unmotivated, and some were in a state of discouragement or despair over losses in which enthusiasm for self-care was non-existent. Others presented a vague internal resistance against actively cooperating with treatments, possibly related to what is currently identified as *moral injury* (MI) (Litz et al., 2009) caused by war engagements. These conflicts refer to choices made under extreme pressure, such as passively witnessing unethical horrors, being unable to act on one's highest values, and harming children and the elderly, among other schemes (Held et al., 2019). Such MIs applied in particular to the German population, which after the rendition faced the painful moral reality of accepting responsibility for its actions, but also to other soldiers, the resistance, civilian survivors who left loved ones behind, including children, or civilians who had to kill in self-defense or defense of others. Many felt that they violated their moral code and values, which generated survivor's guilt and sorrow, making it difficult to forgive oneself and actively engage in self-care. Those who did cooperate never achieved a satisfying level of relaxation (Sándor, 1969).
2. During the war and post-war circumstances, there were no guarantees of a tranquil life ahead, no returning to the integrity of a home, a family, or even a community, as seen in the current struggles to rebuild a country after wars and the refugee conditions globally. At the time, war adversity and scars were not a thing of the past but an unfolding drama for the foreseeable future (Sándor, 1969). The expectation of expatriation and the future shock of adapting to a new culture with its demands without time to grieve or recover from war adversity aggravated the refugees' psychological distress. Today, with the immediate airing of global news, these considerations are still seen as part of the process of surviving wars, perhaps in a world that is even more inhospitable to refugees because it is increasingly divided and self-preserving (Landmann et al., 2019), lacking the worldwide compassionate attitude that somehow permeated the end of WWII.
3. Sándor wanted to restore self-regulated states without using traumatic states as a starting

point for intervention because it would make trauma an intrinsic part of the newly achieved state. Sándor wanted to restore a baseline of regulated states based on the resilient capacity for experiencing well-being. In addition, there are many levels to a traumatic scar; some levels are accessible more immediately, and others may require a degree of ego strength and developmental maturity that may not be present at the time of the initial treatment. It is not only about increasing the window of tolerance to handle traumatic symptoms and triggers but also about restoring some developmental normalcy before addressing specific trauma, strengthening the individual first.

For these reasons, Sándor proposed a passive technique, which did not require willpower to engage, or behavioral/cognitive cooperation, only the acceptance of gentle touch. Initially, he developed the Calatonia technique in an interactive, dialectical way by asking permission from his patients to try to help them feel better (decrease pain) with gentle manipulation of the neck and extremities of the body, complemented by minimal (passive) movements. He asked patients for immediate feedback about how they felt when he supported, moved, or touched, in a gentle manner, the distal parts of their body, i.e., lower legs, feet, forearms, hands, and head (Sándor, 1969). This process led to the development of a sequence of touches and movements formally named Calatonia.

It became evident that this somatic connection with the patient and a compassionate rapport enabled muscular relaxation, vasomotor reactions, and mood and motivational changes of unexpected magnitude in those patients who responded very positively to the treatment (Sándor, 1969).

Similar experiments were carried out in German hospitals, specifically in the psychiatric ward, during a three-year stay in Germany after the war's end (Sándor, 1969). In this setting, Sándor used the technique on patients suffering from what was much later recognized as post-traumatic stress disorder (PTSD; Turnbull, 1998), those with psychological or neuropsychiatric disorders, and members of the mortified German population.

Most notably, part of the history of this technique links to Sándor's personal life. He was a wounded healer and a resilient war survivor, as well. He lost his parents in a war incident in which the allies mistakenly attacked the train his parents were on when Sándor briefly visited them at a train stop. Later that same year, he lost his wife to pneumonia during their time at the refugee camps: she was 27 years of age, and they had two toddlers.

Sándor made it his principle not to use invasive or cathartic methods to induce emotional abreactions or catharsis. However, he worked with such responses when they emerged spontaneously or gently actuated (e.g., by holding someone's hands). Thus, he empathically respected patients' boundaries, first focusing on strengthening the body and psyche by promoting well-being from regulated states and restoring people's trust in others and life.

By the early 1960s, Sándor had already developed a busy integrative psychotherapy practice and was teaching his method at the Pontifical Catholic University in São Paulo, where he settled after the war. He also conducted study groups on Jungian psychology, having translated several books and texts on that topic that were not yet available in Brazil for his groups.

His work was influential and integral to the Brazilian history of body psychotherapy and somatic practices, although not always acknowledged in historical accounts (Kignel, 2020). He was known and respected by his peers, both in São Paulo and Rio de Janeiro, the main cultural centers of the time in Brazil. At that time, the prevailing body psychotherapy trends in Sao Paulo and Rio de Janeiro were Gestalt, Bioenergetics, and Reichian approaches, supported by extensive translated literature. In this context, his method stood out as innovative for its primary objective, achieving self-regulated states through subtle touch while facilitating physical, emotional, and mental tensions to gently dissolve and integrate (Farah, 2017).

Calatonia is also a method of self-awareness because touch refers to a system with a primary function as a protecting layer/organ (Blanchard, 2021), which, to that effect, touch activates large neural maps to identify quickly, locate, appraise, and respond to its occurrence in the body. However, beyond touch perception, awareness in Calatonia refers to attention to spontaneous interoceptive events, muscle release, fasciculations, tremors, and other spontaneous bodily reactions that may occur as the body seeks self-regulated states. Usually, those events emerging during or after Cala-

tonia are related to tensions or vulnerabilities that released their grip on the body. According to the idiosyncratic psychological makeup of each patient, it may emerge in their field of awareness as an image, a feeling, a thought, a perception of a physical sensation, creative energy, or a positive change in mood.

Sándor was respectful of the patients' newly discovered relationship with their bodies and appreciative of how each individual developed the "inner observer," defined as that non-judgmental self that notices somatic events and describes those events in their terms. The aim was to start where patients were regarding their connection with their bodily experience, not necessarily where the therapist deemed it essential. Many were stuck at the very beginning of their emotional development due to neglect, abuse, trauma, or fear of their physicality, as in anxious states or chronic illnesses. They needed nurturance to develop a new, positive relationship with the body. After the application of Calatonia, when asked if there was any observation, some patients spoke about their felt experiences or associated perceptions, emotional issues, or thoughts; others preferred to stay quiet in the presence of the therapist while letting the process complete itself; others chose to write or draw (Blanchard et al., 2019).

Although widely published and researched in Brazilian academia, Calatonia has remained relatively unknown internationally but for a handful of publications in English, including self-published initiatives. A list of such publications is available at Calatonia.org.

This fact is undoubtedly due to a language barrier (Ammon, 2012) and, perhaps, a bias from developed countries against specialized knowledge from developing countries. Certainly not with the conscious intention to harm, possibly because of the unconscious upper hand of cultural complexes (Amsler, 2016; Singer & Kimbles, 2004) by both developing countries seeking foreign "mainstream" knowledge to feel a sense of global belonging and developed countries seeking to export their expertise without interest for local knowledge beyond the exotic and native traditions. There are several initiatives to create a more sustainable professional and academic relationship globally, leveling the unfairness of the current state of affairs. However, it is far from resolution and still within a "nobody's fault, everybody's responsibility case" to improve matters.

Finally, the contribution of Sándor's method to trauma-based therapies (Herbert, 2019) is invaluable, and its uniqueness and novelty remain unparalleled (Blanchard & Comfort, 2020). Its apparent simplicity hides a set of complex stimuli that put in motion an array of psychophysical mechanisms that lead to self-regulation of the body, brain, mind, and emotions (Blanchard, 2021), discussed below. Most importantly, it can complement any movement-based or other somatic or body psychotherapy approaches and any theoretical approach that values an integrative perspective.

Underpinnings

Ahead of his time, Sándor's (1969) then-new method remains today as it has always been based on neurobiology, particularly the neurobiology of dyadic regulation by retraining self-regulated states in the presence of another who is in sync with the patient. It also uses cognitive neuroscience: the integration of mind wandering, self-reflective events, memories, and other spontaneous mentation that occur during or subsequently. In addition, by using sustained bilateral stimulation, Calatonia activates and restores inter-hemispheric processing for supporting higher-order cognitive processes. From the neuroscience of networks (Kelso & Tognoli, 2009), Calatonia may strengthen brain metastability and self-regulation by activating the resting state network coupled with passive sensory stimulation. Lastly, it incorporates the neurophysiology of the skin, the most extensive surveillance system of the body – always turned on – to decrease chronic and acute hypervigilant states, among other skin-related aspects (Blanchard, 2021). One example of this autonomic hypervigilance can be seen in the skin conductance response, a sympathetic autonomic (arousal) response to an internal or external stimulus (Bauer et al., 2022).

Given the introductory character of this article, it will focus on a few foundational neuroscientific hypotheses about Calatonia, bearing in mind that these aspects work in synergy with several other elements set in motion by this technique (Blanchard, 2021), in addition to the fact that touch evokes multisensory integrations (Spence, 2022). For more information, besides the references of

this article, the book *Calatonia e Toque Sutis, enfoque neuroscientifico* (Blanchard, 2021) (Calatonia and Subtle Touch, a neuroscientific focus), presents an in-depth study of the neuroscience hypotheses behind Sándor's work. Blanchard and Comfort (2020) explain the use of the *orienting reflex* (OR) (Bradley, 2009) in Sándor's Calatonia, along with an illustrated description of the technique reproduced in this article.

The Orienting Reflex

The OR in Calatonia prompts bottom-up attentional and motivational patterns via the input of a new and neutral (or pleasant) sensory stimulation. In clinical psychology, motivation should have equal status, as a concept, to resilience; however, very few psychological (and somatic) approaches take into consideration the fact that motivation, at its base, is of an autonomic, instinctual nature shared with other species, an intrinsic development from new, non-threatening sensory stimuli (Bradley, 2009). During Calatonia, the engagement of the OR helps to reorganize the individual's motivational and appetitive systems, reinstating a healthy drive to engage with life (Blanchard, 2021; Blanchard & Comfort, 2020). This drive cannot be defined in terms of any specific quality of drive, such as Freudian sexual libido, for instance. Instead, it is better understood as a drive to explore, which enhances curiosity, engagement, learning, overall self-development, and a pre-social reflex (Pavlov, 1927). This spontaneous response differs from a response to a potential threat or aversive stimulus. Instead of eliciting an avoidant reaction, the OR is our informal default mode of engaging with the environment and learning from infancy to adulthood (Bradley, 2009).

At the same time, the more often an OR is triggered, the less frequently the defensive and the startle reflexes will operate as symptomatology of PTSD in response to new non-threatening stimuli. The OR is a set of bodily indicators that signal the biological relevance of an environmental stimulus to ascertain its value (Bradley, 2009), including its significance as a psychological novelty (Blanchard & Comfort, 2020). Sándor purposefully thought of ways of creating ORs by using out-of-ordinary light touch and other novel stimuli that would be of value to the organism, such as passive movements that the patient cannot voluntarily perform (e.g., rotating the patient's finger sideways), small vibrations applied to the spinous process, and other techniques under the umbrella of Subtle Touches (Delmanto, 2008; Farah, 2017). The perception of vibration is detected by highly myelinated fibers, the Pacinian and Meissner corpuscles (Abraira & Ginty, 2013), and this novel stimulation of spinous processes can generate a quick reorganization (and awareness) of the tension held in ligaments and joints along with psychological repercussions caused by the new adjustment. Calatonia triggers ORs due to its noninvasive nature experienced as either neutral or pleasant affect and the novelty of its touch stimuli; each touch is static and sustained softly at each of the seven contact points and held gently at two other contact points on the body.

The Resting State Network

The technique begins with a supine position with eyes closed, commonly known to encourage the activation of the parasympathetic system and release postural tension. These events support relaxation, particularly in dyadic regulation.

Most importantly, since the advent of brain image research, the supine position has been identified in cognitive neuroscience as the baseline position of the brain at rest, in which a typical brain connectivity naturally emerges, the *resting state network* (RSN) (Kelso & Tognoli, 2009). A healthy RSN connectivity is a measure or a marker of overall healthy functional connectivity of the brain (Menon, 2011), during which the brain is thought to be regulating its large-scale brain networks (functional connectivity) in tandem with local brain networks (structural networks) (Kelso & Tognoli, 2009). Therefore, the RSN may be a therapeutic medium for somatic or body-based techniques to encourage brain self-regulation. That is one complementary aspect of the Calatonia technique to other movement-based or active engagement therapies. By proposing a silent, non-task-oriented approach to resting-state functional connectivity coupled with a steady, slow influx of unusual passive stimuli, Calatonia provides the appropriate environment in which brain regulation can take place in the safety of dyadic regulation (Blanchard, 2021).

The Default Mode Network

One of the most prominent functional brain networks that appear during RSN is the *default mode network* (DMN) (Smallwood & Schooler, 2015),

identified as the neural correlate of mind-wandering events, self-reflective mental states, and considering the perspective of others. Before receiving Calatonia, the therapist suggests that patients turn their attention to the tactile stimulus if their minds engage in executive mode (concerned with time and space, the "agenda mind") or in uncomfortable obsessive thoughts. However, the therapist also suggests that patients let their minds wander if their thoughts become random, spontaneous, or dreamlike and even fall asleep if that happens naturally (Blanchard, 2021). This selective mode of mental engagement distinguishes between the executive, chatty, obsessive mind and the creative, self-regulating mind that emerges within the healthy mind-wandering process of the DMN. Teaching the patient to orient this attentional process may facilitate the resetting of rumination and obsessive thoughts towards a self-regulating mind process and, consequently, cooperate to restore a healthy DMN. Unlike mindfulness approaches in which thoughts are dismissed, in Calatonia, they are integrated selectively (healthy DMN mind-wandering).

The DMN is essential for normal mental functioning, associated with the self-based activity of the parasympathetic. Abnormal DMN activity is evident in several disorders, including Alzheimer's, dementia, autism, PTSD, schizophrenia, Parkinson's, epilepsy, anxiety and depression, autism, and attention-deficit/hyperactivity disorder, among others (Broyd et al., 2009; Menon, 2011). The activation of the DMN is of psychological interest in somatic psychology, as it supports higher-order self-awareness, awareness of others, and emotional and cognitive processing (Broyd et al., 2009). For those dismissing the importance of the DMN for psychological well-being, it should be noted that the DMN has a developmental importance. Studies performed with fetal rs-fMRI showed the presence of a primitive form of the DMN, indicating that a proto-DMN may already be present in the fetus, and by two years of age, DMN connectivity has a pattern similar to that found in adults (Edde et al., 2021; van den Heuvel & Thomason, 2016). The misrepresentation of the DMN as the network that sustains the "chatting mind" might be a reference to a dysregulated DMN, and this misattribution may dismiss the therapeutic significance of the DMN as the functional connectivity in which narratives about self and others can be transformed (Blanchard, 2021).

Ultimately, the DMN seems to be the neural correlate of the mind's self-regulatory processes when the individual is in RSN functional connectivity, the connectivity in which the brain's self-regulation occurs. As Llinás (2002, p. 4) proposed, *"If we could observe or feel the brain at work, it would be immediately obvious that neuronal function is as related to how we see, interpret, and react, as muscle contractions are related to the movements we make."* At the time of Llinás's assertion, brain image research on the neuroscience of networks was in its infancy. However, 20 years later, this research has demonstrated that brain and mind events couple; if the brain is self-regulating, so is the mind, producing thoughts that will move the person to a better self-understanding and a more adaptive standing in life.

Psychiatric and neurological treatments are currently experimenting with neuromodulation devices, such as (implanted) deep brain stimulators (DBS), and noninvasive methods, such as transcranial magnetic stimulation (TMS) and transcranial current methods (tACS, tDCS) to stimulate specific brain networks (Holtzheimer & Mayberg, 2011; Tortella et al., 2015). These treatments are intended to improve outcomes for treatment-resistant depression, schizophrenia, bipolar disorder, treatment-refractory obsessive-compulsive disorder, Tourette's Syndrome, addiction, and other psychiatric and neurological disorders (Holtzheimer & Mayberg, 2011; Tortella et al., 2015). However, this "compartmentalized modulation" of specific brain networks proposed with electronic devices misses the whole brain self-regulation and the mind processes resulting from brain self-regulation. It is possible to activate the built-in, self-regulating mechanism of the brain with the proper set of circumstances, noticing that these neuromodulation treatments use the same pathways that natural environmental stimuli use (Black & Rogers, 2020) – the reverse might be true – this points to the possibility of considering natural sensory stimulation to modulate brain oscillations.

Calatonia Touch Sequences

Here is an illustrated description of the technique:

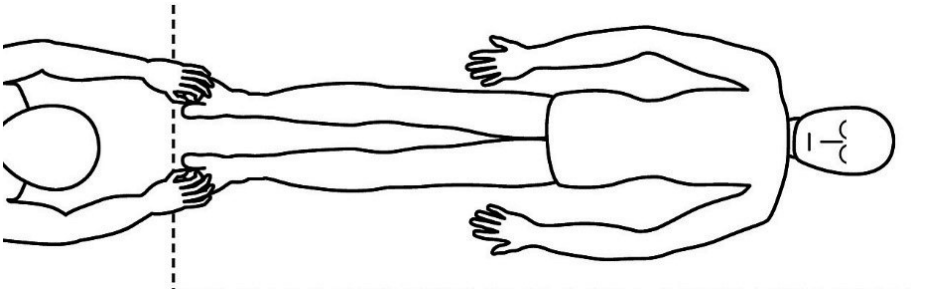

Figure 1. *Resting State (task-free) Supine Position*

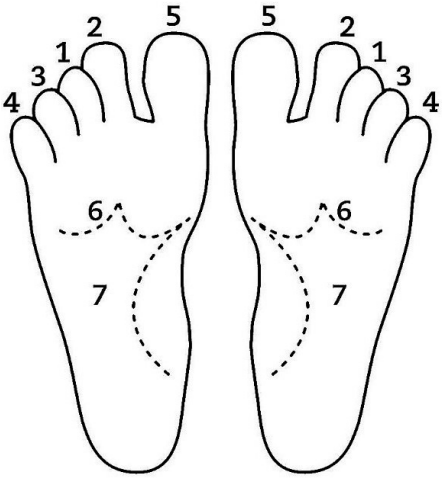

Figure 2.
The sequential order of bilateral points of tactile contact

Figure 3. *Ankle support, eighth bilateral touch*

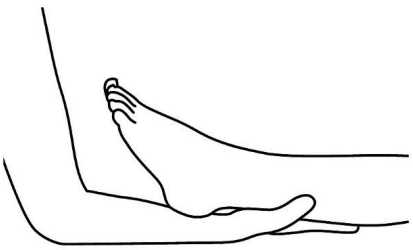

Figure 4. *Calf support, ninth bilateral touch*

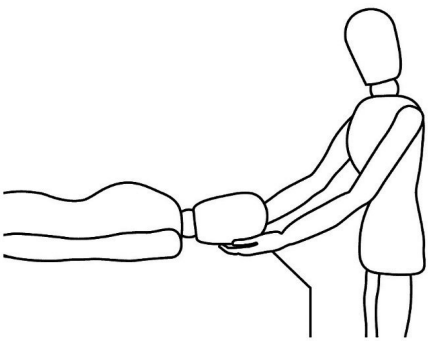

Figure 5. *Head support, optional tenth and last touch*

After the patient lies in a resting state position, the therapist delivers a sequence of seven simultaneous bilateral touches to the toes and soles of the feet, two supporting postures of ankles and calves, and a final optional tenth point of contact supporting the head. All points of contact are held steadily for three minutes before moving to the next one, which places the patient and the therapist in time-modulated sync via touch. This paced harmonization between patient and therapist "agrees" with physiological life, which is based on rhythms: heartbeats, cortisol release timing, breathing, speech, walking, chewing, running, swimming, and so on (Lakatos et al., 2019); including brain waves, *"rhythms are a prominent signature of brain activity"* (Jones, 2016, p. 72). Using temporal synchronization in the form of a steady pattern of repetition in time also activates higher-order integrative functional connectivity similar to the processing of musical rhythms, and rhythm binds attention (Schirmer et al., 2016). The application of passive touch does not disturb the RSN as rhythmic passive sensorial input can be absorbed by coupling with large-scale networks via neural entrainment (Lakatos et al., 2019).

Behavioral Synchronization in Dyadic Regulation

Developmental and attachment psychology extensively studied the need for touch and containment through touch throughout developmental phases in lifespan (Blanchard, 2021; Goldstein et al., 2017; McParlin et al., 2022).

Attachment patterns generate a template for social interactions, streaming from the social regulation of the brain. Social regulation of the brain originates from inter-cerebral processes that emerge within the parent-infant bond (Feldman, 2017) and are fundamental for establishing a pattern of neural regulation and for the development of physiological and behavioral systems that support participation in social life (Djalovski et al., 2021; Goldstein et al., 2017). The mechanism that underpins the regulation of the social brain is biobehavioral synchrony, the coordination of physiological and behavioral processes during moments of social contact (Feldman, 2017). Research has found that behavioral synchrony (Nguyen et al., 2021) provides the basic model for inter-cerebral regulatory processes, which, in the case of Calatonia, is based on behavioral synchronization in dyadic regulation in resting-state neural connectivity through static, simultaneous, and timed sequence of touch contacts (Blanchard & Comfort, 2020).

C-tactile Skin Receptors and Merkel Cell-neurite Complexes

Calatonia's subtle touch is processed by receptors that register a light touch. One such receptor targeted during Calatonia is the C-tactile (CT) (Löken et al., 2009), present in hairy skin and absent in glabrous skin on the palms and soles (Abraira & Ginty, 2013). CT receptors are part of mammals' bonding and grooming system (Löken et al., 2009). In humans, these receptors form the affective and affiliative system of the skin, a system loaded with emotional value (McGlone et al., 2014). C-tactile reaches the nervous system by slow unmyelinated afferent fibers.

Another skin receptor that registers soft touch is the Merkel disk, which is part of the discriminative-spatial system (Abraira & Ginty, 2013), distributed throughout the body but in high concentration on the fingertips and palms of the hands and on the tips of the toes and soles of the feet. These are complex receptors innervated by highly myelinated, fast-conducting afferents, which respond to touch even lighter than the gentle touch the C-Tactile can register (Maricich et al., 2009).

In addition to its role as a mechanoreceptor, each Merkel disk connects with another specialized cell containing valves that release peptides that modulate the nerve ending, forming the Merkel cell-neuritis complex, which also participates in the skin's immune system (Xiao et al., 2014) and pain processing (Auvray et al., 2010). This Merkel cell-neurite complex is also involved in a somatosensory system of two mechanoreceptors that respond to touch, composed of some mechanosensitive sensory neurons and 5-HT releasers and mechanosensitive epithelial Merkel cells, which resemble the system present in the intestine (Mercado-Perez & Beyder, 2022; Xiao et al., 2014).

The various properties of Merkel disks (Xiao et al., 2014) have led to the assumption that they play an essential role in statically sensing rough shapes, edges, and textures (Abraira & Ginty, 2013). Merkel disks investigate the characteristics of the stimulus concerning location, direction, and pressure and are slow to adapt; that is, they keep responding to the stimulus throughout its duration (Abraira & Ginty, 2013; McGlone et al., 2014).

Merkel disk receptors are essential in reading braille (Millar, 1997), which requires language, spatial, and touch integration to generate semantic meaning (narrative), lexical discrimination (word recognition), and haptic (movements) processes, respectively. These spatial and language encodings enlist functional connectivity from both hemispheres of the brain to complete the task of reading, each hemisphere orchestrating different aspects of this higher-order, highly associative process through touch.

Likewise, Merkel's disks found on the soles of the feet, support movement, balanced gait, standing, and postural tension. These processes begin on the soles of the feet, in coordination with the cerebellum and vestibular system (inner ear). The cerebellum and vestibular system work together to interpret sensory input, creating advanced models to allow adaptation to changes in the environment. This integrated system orchestrates the movement and related emotional assessment (for example, facial tension or crying while running reflects a different emotional context than running with open arms and a smile), cognitive estimates (related to movement or stimulus), balance and body position in space, among other contextual characteristics related to standing, lying, or moving (Pierce & Péron, 2020).

Simultaneous Emotional Modulation and Cognitive Integration

In a psychological context, employing therapeutic touch to modulate emotional dysregulation and possibly rescripting attachment issues generally means to use the help of the CT system of the hairy skin, associated with the limbic-related cortex, representing an innate, non-learned process (McGlone et al., 2014). Unmyelinated or lightly myelinated afferents such as the ones connected to the CT system are associated with interoceptive processing, and they signal feelings rather than sensing states and control organ functions that do not reach conscious perception (McGlone et al., 2014; Mercado-Perez & Beyder, 2022). The discriminative system processes pleasantness (a gentle touch on the glabrous skin of the palms of hands, for instance); however, there is only activation of the somatosensory cortices, representing a learned or secondary reinforcement mechanism of a feeling tone (McGlone et al., 2012). Because the hairy skin contains skin receptors of both discriminative and affective systems, the stimulation of the hairy skin with a soft brush activates both systems, processed respectively by the somatosensory cortices (discriminative) and the insular cortex region (affective) (McGlone et al., 2014). The latter is an area related to the input of sensory systems to emotional systems of the frontal lobe (Craig, 2008).

However, in the Calatonia protocol, touches are delivered simultaneously to the area in which only the receptors of the discriminative system are found and in great numbers (glabrous skin of the toes and soles of the feet) and the area in which CTs and several other skin receptors are located (the upper part of the feet, ankles and calves); thus, it creates a peculiar stimulation that results in a new neural assembly around these two systems (discriminative and affective). When Sándor configured this technique, the affective and the discriminative systems were known respectively as protopathic and epicritic systems (Sándor, 1969; Semmes, 2017), a terminology conceived by the English neurologist Henry Head (1861-1940) and embraced by the British-American anthropologist Ashley Montagu (1905-1999) in his pioneer work about touch. Sándor thought of activating both systems at once so that cognitive (discriminative system) and emotional (affective system) could "interact" with higher intensity and potentially balance each other (Sándor, 1969). In this case, the discriminative system might offer differentiation and expression to the affective system, and the affective system may offer a richer, spontaneous, relational new dimension to discriminative engagement.

The discriminative system is needed to identify feelings and represent them. The lack of connection between the discriminative and affective systems is seen in alexithymia; Goerlich-Dobre et al. (2014) suggested that affective dysregulation in alexithymia has two components, "an affective dimension, involving emotionalization and fantasy, and a cognitive dimension, involving identifying, differentiating, and describing feelings" (p. 284). These two dimensions are associated with the somatosensory system (Kropf et al., 2019) and with the skin's affective/affiliative (protopathic) and discriminative/spatial (epicritic) systems.

In addition, the discriminative system is part of the skin surveillance system; think of the reaction

to a mosquito bite to identify this conscious surveillance system – and here lies a critical aspect of this system for trauma therapy because the skin is the body's most extensive surveillance system. Because of this relationship, the discriminative system has a capacity for appraisal of what is of value to the organism, and what contributes to its best chances of survival. The fast-paced myelinated system contributes to this at the central nervous system level; therefore, it is a target for redefining levels of hypervigilance, attention and alertness, particularly when stimulated in the safety of a dyadic regulation. In sum, regulating emotions without bringing the two systems into rapport is not enough.

Endocrine Resetting

The skin also houses a "silent system" for human consciousness (subcortical processing), which interacts with the surrounding environment from a protective, defensive, and immunological perspective, responding to light, chemicals, moisture, and foreign or insulting elements and expressing itself by releasing toxins, chemical discharges, hormones, among other products. Cutaneous nerves are not sensory per se. They are involved in several functions that integrate with the immune system, sleep, vitamin D production, and endocrine system regulation locally (within the dermis) and globally (whole organism) through the hypothalamus, pituitary, and adrenal axis (HPA axis; Slominski et al., 2012). Even though we may not perceive consciously the stimulation to the cutaneous nerves, touch can affect them. The involvement of cutaneous nerves during Calatonia may explain the frequently observed resetting of the endocrine system to healthier homeostatic values and the decrease in the HPA axis. Slominski et al. (2012) proposed that the HPA axis may have been generated primarily at the skin level and then secondarily reproduced by the brain as an effective system to respond to stress.

Sensory Bilateral Stimulation and the Corpus Callosum

In addition, Sándor's Calatonia proposes complex stimuli that the somatosensory cortex, particularly the secondary somatosensory system (SII), will necessarily process via the corpus, known for facilitating higher order and complex integration (Bretas et al., 2020; Kropf et al., 2019). According to Bretas (2020, p. 259), the SII participates in processes that *"require high-level information integration, such as self-consciousness, social relations, whole body representation, and metaphorical extrapolations."* The metaphorical extrapolations refer to the fact that the use of sensory metaphors in speech, such as someone "being rough or abrasive," activates the SII area of the brain that processes rough and abrasive tactile experiences, attaching to those experiences a negative affect as well (Bretas et al., 2020; Lacey et al., 2012). This hints at the relationship between sensory experiences and the ability to elaborate metaphors from the repertoire of sensory memory. It is known that there are sensory processing deficits in autism (Riquelme et al., 2016), and it would be relevant to research whether the difficulty processing metaphors come from the sensory deficits (Lacey et al., 2012).

The effects of alternating bilateral stimulation have been emphasized extensively in Eye Movement Desensitization and Reprocessing (EMDR; Shapiro, 2014), but nothing has been said about the simultaneous (stationary) bilateral stimulation, which in the Calatonia case allows slower-paced processing as compared to the fast-paced impact of EMDR. This complex stimulation (stationary; identical simultaneous bilateral stimulation, long-duration touch) engages the SII, which has extensive callosal connections to reach associative areas of the brain in response to this sensory input (Bretas et al., 2020; Kropf et al., 2019).

The corpus callosum facilitates higher-order functions of the cerebral cortex, such as a multidimensional representation of information, associative and executive tasks, coordination of sensory-motor responses, cognitive processing, and management of social and emotional stimuli (Hinkley et al., 2012; Shobe, 2014). PTSD in adults and childhood trauma can affect the structure (atrophy) and connectivity of white matter tracts, particularly the corpus callosum (Siehl et al., 2018; van der Kolk, 2003), and the smaller the corpus callosum, the less traffic can occur at any given time, the less sophisticated level of cognitive integration, i.e., less capacity for cortical complexity and integration (Blanchard, 2021). However, the corpus callosum plasticity can be enhanced by sensory activity (Bretas et al., 2020) and dynamically regulated by healthy brain functional connectivity activity. Thus, it is essential to deliver stimuli that activate the corpus callosum to restore interhemispheric

communication and higher-order processing. As Sándor informally mentioned in the classroom, "Calatonia 'sweeps' the corpus callosum and helps to restore its healthy functionality" (Blanchard, 2021, p. 9).

The exercise created by Sándor (1969) to help patients achieve self-regulation on their own once they received a first Calatonia is an exercise in alternating bilateral attention, a technique that predates EMDR. The self-conditioning practice proposes that the patient focuses on one point of their choice, for instance, the seventh point of Calatonia, right in the center of the foot arch. The patient is taught to sustain attention on that point on the right foot for three complete breathing cycles, followed by focusing on the same point on the left foot for three full breaths, repeating these steps three to five times, three times a day.

Integration of Calatonia in Psychotherapy

It is worth mentioning the easy acceptance of Calatonia in contrast to more intense and focused methods such as EMDR. In the case of an African American veteran of Iraq and Afghanistan (Blanchard, 2021), the patient was explained and offered the EMDR to address some residual trauma after many years of cognitive therapy and group therapy with the Somatic Experiencing method (Brom et al., 2017), but flatly refused it, *"no way I will relive those incidents."* The therapist explained and suggested Calatonia instead, and the response was, *"I will give it a go,"* despite his lack of eye contact with the therapist and some expected initial mistrust.

Following the first session of Calatonia, he reported a few physical sensations, described *"energy coming out of his toes"* and feeling lighter and refreshed. He appeared surprised by the results of the technique, and at the end of that first Calatonia session, he offered to shake hands while maintaining good eye contact and saying to the therapist, *"thank you."* From that session on, despite having substance abuse issues that could prevent him from keeping regular commitments, this patient never missed an appointment, traveling at least 40 minutes to attend them. The experience of dyadic regulation proposed by the technique not only won his trust but with regular repetitions, there was a shift in the content of his dreams, which went from nightmares with diabolical and threatening characters to themes related to his real life. The dreams presented situations with family members, romantic interests, and war dreams in which he performed roles that did not agree with his values, thus providing tailored (by his psyche's priority issues) topics addressed in verbal therapy.

In Jungian terms, the psyche is also a self-regulating mechanism, prioritizing and producing psychical events, such as dreams and fantasies, which will regulate the individual's attitude in life:

> *Dreams are impartial, spontaneous products of the unconscious psyche, outside the control of the will. They are pure nature; they show us the unvarnished, natural truth and are therefore fitted, as nothing else is, to give us back an attitude that accords with our basic human nature when our consciousness has strayed too far from its foundations and run into an impasse.* (Jung, 2014, para. 317)

As the dreams decreased in intensity from nightmare to narratives about his life, he grew an interest in their meaning, and instead of fearing and avoiding them, he developed a fuller inner life.

While other complementary modalities in psychotherapy may generate similar benefits, such as yoga, meditation, tai-chi, and mindfulness practices, among others, they do require motivation and self-discipline, which are not always present in patients, both in the case of patients of war adversities and refugee displacement, but also those in regular psychotherapy. A passive technique may provide the needed support and nurturance to foster self-care until the patient is able to exercise self-agency.

Calatonia is life-affirming and encourages resilience building structured around the global reorganization and mutual regulation of soma and psyche which creates neural connections associated purely with new self-regulated states and not with symptomatology, leading to an enduring sense of well-being.

Calatonia was registered as a name brand by Pethö Sándor's students in 2007.

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