CONNECTION BETWEEN OCD AND PTSD, FASCIA NETWORK AND INSULA

In recent years, there has been much research in Psychology based upon “functional connectivity” between the various brain and nervous system networks. I will discuss the most relevant studies for your psychotherapy and then present my clinical insights about these studies. First, to define “functional connectivity”: this is a term applied to the statistical relationship (science comparisons) between signals sent back and forth between various body organs. These measurements are taken by equipment such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG) or magnetic electroencephalography (MEG). (1, 2)

Recent studies have focused on the “salience network (SN)”, which is a term applied to the interactions between the dorsal anterior cingulate, anterior insular cortices and several subcortical brain areas. Please recall that the “insula” is very important in how the fascia network transmits its information and the role of the insula in communicating this information to the other brain neurons and the nervous system neurons. Recall your IN SYNC psychotherapy: The brain functions of the Insular Cortex is the first brain center to begin to change with the new messages from the fascia system. Your “awareness” of the internal and external sensory messages (from “body scanning awareness”) is the first change to occur, as this level of cellular “awareness” is a direct result of altering the health status of the fascia system.

Functional connectivity studies have shown that certain brain structures are heavily involved in the core mechanisms of anxiety, in particular, the anterior insula and dorsal anterior cingulate cortex. These structures appear to “appraise and regulate emotional salience” in order to activate threat-related reactions. What does “appraise and regulate emotional salience” mean? The body has an attentional mechanism by which we learn and survive. This gives us the ability to focus our perceptual and cognitive resources on the pertinent (salient) sensory data. In the fascia network and the sympathetic nervous system, this is a “bottom-up, memory-free, and reactive” response to the sensory data.

Our adult brains do not fully develop until about age 25. Prior to that time, our SN (salience network) is hyper-sensitive to the reactionary processes and do not have the maturity to use the higher brain cognitive resources most effectively in dangerous situations. This leads the brain to misinterpret sensory data, including social cues and visual data. (4) Research has shown that adolescents have an immature brain function in this SN capacity. (3)

In adult studies, individuals with OCD have shown decreases in the SN’s function in detecting and filtering internal and external salient information, not being able to effectively engage the positive task function and disengage the negative task function. In other words, the insula still appears to operate like the young adolescent brain. Except now, the adult individual also cannot stop the obsessive thoughts and/or behaviors. (5)

Why can’t they stop the OCD? Other OCD studies (of adults) have revealed that the Prefrontal Cortex (PFC) stores OCD memories in a very different fashion than other memories. This method has been termed “structured event complexes” (SECs) that have beginnings and ends, but that are encoded more like memories of complex motor programs of the posterior cortexes rather than in usual PFC memory fashion. This means that if an SEC memory is activated, the individual feels compelled to complete the “activity” (whether thought or behavior) or else have anxiety or other distress. (6)

The studies in “functional connectivity” are still growing and, I am confident, will provide more scientific support for professional practitioners in the future. But, in the meantime, I will provide you with my interpretation of these research findings, in light of my past 40 years of treating individuals with PTSD and OCD.

We are now aware, as Psychologists, that OCD (sometimes with dissociation) is a usual component of adult PTSD. We know that the roots of chronic trauma lie in childhood and/or adolescence. The present research indicates that the cause of childhood trauma-stored memories is that the young brain cannot effectively process the danger signals from the fascia, which are communicated to the insula. These signals come via the haptic perceptual sense. (8) Human haptics is the term for the “touch sense” which consists of peripheral sensory receptors in skin (cutaneous), and in muscles, tendons, and joints (kinesthetic). The form of communication to the brain is in the form of vibrations.

There are different “perceptions” from the cutaneous and the kinesthetic receptors. The skin tends to respond to a “passive touch” by focusing the individual’s attention on his/her subjective bodily sensations (interoceptive), whereas contact with the kinesthetic tends to guide the attention to properties of the external environment (exteroceptive). This haptic perceptual sense is the first stage in language development, with 80% of our prefrontal cortex early language comprehension being dependent on oral stimulation and hand-movements. (8)

Though the insula tries to communicate to the other brain structures (with haptic sensations, sent to the somatosensory cortex), there is not sufficient “language experience” to allow for a conscious response to the danger. Depending on the stage of language development, the young person’s brain will encode the specific motor pattern which occurred with the trauma, storing it in both the “body memory” (fascia) as well as in the immature Prefrontal Cortex. Therefore, the memory resides mostly as an unconscious storage of behavioral sequences which were associated with trauma-related anxiety. The individual may not even be able to describe the trauma event/memory in “words” and is limited to accessing and expressing the experience “non-verbally” via the haptic perception memory.

At the time of the trauma event, the individual may have experienced a somatic response to the anxiety/fear reaction which served to “calm” the individual. This response also gets “encoded” along with the trigger event. In other words, the individual may have experienced a specific “motor pattern” of behavior as a way of resolving/reducing anxiety associated with a trauma (or a re-trigger of the event). The “motor pattern” occurred without conscious awareness or intention, thus being stored via the fascia system and in the unconscious brain functions. However, with repetition (when trauma memory is re-triggered), the “motor pattern” becomes re-stored in the prefrontal cortex (PFC) as the client begins to consciously associate the behavior to a partial reduction in anxiety. But it gets stored without the original haptic perception trauma memory, as this memory is part of the fascia system only, not the PFC. Thus, the behavior (now termed “OCD”) is associated with the trauma, but becomes a “cognitive superstition” (i.e., OCD) due to the dissociation from conscious awareness. In PTSD, the “motor pattern” may become a repetitive “thought” without compulsive acting-out behavior.

What does all this mean for your psychotherapy treatment? OCD treatment is integrated with your other interventions. OCD thoughts and/or behaviors are not addressed until you have gained basic skills: 1) integration of Progressive Relaxation with Deep Breathing; 2) Mindful Body Scanning; 3) Quick Reset skills; 4) ability to keep a Daily Journal. You are assigned an OCD workbook at the beginning of your treatment. When you have completed most of the workbook, you will manifest a very different understanding of OCD. At that point, we will begin to implement techniques specifically focused for OCD thoughts and behaviors.

1. <https://www.nature.com/articles/nn.3423> (Opportunities and limitations of intrinsic functional connectivity MRI)
2. <https://www.sciencedirect.com/topics/psychology/functional-connectivity>
3. <https://www.frontiersin.org/articles/10.3389/fnbeh.2015.00350/full> (Decreased Intra- and Inter-Salience Network Functional Connectivity is Related to Trait Anxiety in Adolescents)
4. <https://en.wikipedia.org/wiki/Salience_(neuroscience)>
5. <https://www.frontiersin.org/articles/10.3389/fnins.2018.00889/full> (Decreased Intrinsic Functional Connectivity of the Salience Network in Drug-Naïve Patients with Obsessive-Compulsive Disorder)
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4476073/> (A Psychological and Neuroanatomical Model of Obsessive-Compulsive Disorder)
7. <https://link.springer.com/content/pdf/10.3758/APP.71.7.1439.pdf> (Haptic perception: A tutorial)
8. <https://www.sensorimotorarttherapy.com/blog/2019/5/17/haptic-perception-as-i-touch-the-clay>