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 neuroscientists 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, Zust, Henke, 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). Psychologists 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 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 psychotherapy 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 anten-
na, 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 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-knowing-ness, 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 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
The Science of Psychotherapy

**Figure 1  Levels of Consciousness**

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<td><strong>Proto-self</strong>&lt;br&gt;Primordial feelings, awareness of body, no language, experiences pain and pleasure</td>
<td><strong>Anoetic Consciousness</strong>&lt;br&gt;“implicit procedural, sensory, and affective memory and on the conceptualization and empirical foundation of raw affective consciousness” (Vandekerckhove, Panksepp, 2009)</td>
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<td><strong>Core self</strong>&lt;br&gt;“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).</td>
<td><strong>Noetic Consciousness</strong>&lt;br&gt;Includes Anoetic consciousness&lt;br&gt;Knowing&lt;br&gt;Associated with semantic memory&lt;br&gt;No mental time travel, but influenced by events in the past</td>
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<td><strong>Autobiographical self</strong>&lt;br&gt;“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)</td>
<td><strong>Autonoetic Consciousness</strong>&lt;br&gt;Includes anoetic and noetic consciousness&lt;br&gt;Knowing that you know&lt;br&gt;Associated with mental time travel&lt;br&gt;Self-awareness</td>
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The self–identity, and complete identification with autonoetic 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 likely 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
(Krpan, 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. Indeed, I am referring again, to psychological reflections of biological operating systems in the brain, or vice-versa. 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) 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).

1 I am defining it from an analytical perspective as the sum total of non-conscious and conscious processes.
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 12th, 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 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 fulfilment 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,
which can understand the manifestations of
the unconscious and take up a position to-
wards 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 resolu-
tion. 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 reac-
tivity. 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 collabo-
ration 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 happen-
ings in imagination are psychological real-
ities, 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 aris-
ing 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 im-
ages 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 dan-
gerous effect which are destructive not only to
others but even the knower... failure to under-
stand them, or a shirking of ethical responsi-
bility, deprives him of his wholeness and im-
poses 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 sig-
nals 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,
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 recruit-
ment of these networks, and the improvement
of their descending inhibitory tracts to amyg-
dala based networks may play a role in bet-
ter regulating our affect. In addition, by giving
specificity and language to the emergent expe-
rience, 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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