Neuroscience, psychotherapy and neuropsychotherapy

- Toni Killin

Therapeutic strategies have been built from hundreds of years of experience. These strategies have over time proven their effectiveness for particular problems(Cozolino, 2010) (Grawe, 2007). The field of Neuroscience looks at brain structures and functions; it is a large field encompassing neurobiology, neurochemistry and areas of psychology. Neuropsychotherapy blends the fields of neuroscience and psychotherapy together. The emphasis being placed on the neuroscientific foundations of psychotherapy. Present rudimentary neuroscientific research findings offer psychotherapy scientific support, putting forward a new and fresh perspective for therapists. Neuropsychotherapy tries to remove the invisible barrier between mind and brain(Cozolino, 2010) (Grawe, 2007). Both the mind and brain are equally important, focusing on either one at the cost of the other would be to act as if one is irrelevant(Cozolino, 2010). My contact with clients and professionals such as therapists, psychiatrists and psychologists led to my interest in Gestalt Therapy. Although my training in Gestalt Therapy is a passion, the journey has been a difficult learning experience. The experiential nature of Gestalt therapy has proven difficult for me to internally intellectualize. It has been this difficulty that led me to readings on neuroscience, as a way to understand, more fully, the mechanisms behind psychotherapy in general, in particular experiential modalities. These modalities reflecting good successes in areas that other modalities were appearing to be only mildly successful(Cozolino, 2010)(Grawe, 2007). I see this as an opportunity to have a deeper and different perspective on the therapeutic process and the therapeutic relationship.

Consequently, this literature review will be divided into three sections. The first will give a rudimentary overview of what neuroscience is and the emergent findings within this field of psychotherapeutic interest.

I will then relate neuroscientific findings broadly to the field of psychotherapy. Subsequently, I will relate some of these findings to some of the methodologies of Gestalt Therapy bringing findings from neuroscience together in the therapeutic relationship with a view to seeing Gestalt Therapy and psychotherapy in general from new and helpful vantage points.

Given that neuroscience is a diverse field encompassing many professions, it is important to make the distinction that this paper will look at neuroscientific findings only in the context of psychotherapy and neuropsychotherapy. There are standardised professional differences not covered as part of this paper between clinical neuropsychologists, clinical neuropsychotherapists and psychotherapists that have good knowledge of areas of neuroscience that are of interest to the modality that they practice.

Neuroscience is a complex area of study to define; it holds its place within all the sciences that deal with the nervous system such as Neurobiology, Neurochemistry, Neuropharmacology and Neuroanatomy. Neuroscience also draws on the knowledge found within many of the traditional disciplines such as Biology, which looks at the living matter in all its forms and phenomena. Biochemistry, the chemistry of living matter. Physiology a branch of biology that deals with functions and activities of living organisms. Pharmacology that delves into the preparation, uses and effects of drugs and Experimental Psychology which uses experimental methods to study mental and emotional

activity in animals and humans(“ What is Neuroscience,” 2012)(dictionary. com),(Stonehill College, Congregation of the Holy Cross, 2014).

Neuropsychotherapy (NPT) is a term used to condense and combine neuroscientific knowledge in a variety of applications and treatments (Neuropsychotherapy. org, 2014). Neuropsychotherapists come from a wide range of medical and therapeutic backgrounds. A neuropsychotherapist is aware of the body-psyche interaction and uses their training and knowledge to carry out therapeutic assessments and treatments.

Recent discoveries show that our experiences change the shape of our brain. Individual areas grow or change by adding miniscule amounts of the brain neural circuitry and eliminating old ones(Aherne, 2012). Knowledge such as this will help the evolution of more effective therapies, healthier connections will further recovery. This type of thinking challenges the metaphors of the past, visually perceiving brains as machines. Analogies made for computers with references to fixed circuitry and hardwiring (Doidge, 2011). Moving beyond the 20 th century where the brain was modelled as a static perspective, we now see the brain as infinite in complexity. Essential regionalised connections are well distributed and integrated throughout the brain. Functions that were thought to be only in localised areas, now are known to participate with other parts of the brain(Fialkoff & Jones, 2010) . New research includes exploring the interaction between neurochemical transmitters and brain cells, looking at previously unknown functions of neurons and glials, the most common cells in the brain(Fialkoff & Jones, 2010) . There are four principles that become apparent to our understanding

of the brain centers. The brain is complex, connected, adaptable (plastic) and evolved. The brain is adaptive, constantly rewriting itself. This ability to grow and change is referred to as plasticity. The brain not only creates new connections and develops greater physical space based on need, it also has the ability to erase old and unused connections(Doidge, 2011). The notion of a brain that can re-design its own form and function through thought and activity is profound. This is amongst the foremost important alterations of the brain since our understanding of basic anatomy and the functioning of its most elementary component, the neuron(Doidge, 2011). Like all revolutions, this has profound effects. The neuroplastic revolution has many implications, all areas that trade with human nature, such as our understanding of relationships, addictions, culture, learning and psychotherapies all change our brain. The humanities, social and physical sciences will all have to come to terms with the fact of the self changing brain. From person to person the brain’s architecture is unique and changes the course of individuals’ lives(Doidge, 2011). One of neurosciences most extraordinary discovery is that thinking, learning and acting can turn our genes on or off, thus sharpening our brain anatomy and our behaviour(Doidge, 2011). Brain plasticity is a very general term, applied to all ways that the brain is flexible and can process information in different ways(Buczynski,). A simplified example of steps in neural plasticity would begin with an inability in neurological functioning, this would lead to the founding of a secondary route. With use this secondary route finds shorter pathways and gets quicker and better at using these secondary neural pathways. With prolonged use and exposure these pathways continue to strengthen(Doidge, 2011). In the brain, there is an optimal point of plasticity at moderate ranges of arousal.

Neural growth hormones and many of the processes that stimulate plasticity turn off at low levels of arousal, turn on at moderate levels, and turn off again at high levels(Buczynski,). This is important information when looking at encouraging new neural pathways. Creating an experience in therapy that results in neuroplasticity are to some degree a marker of successful therapy(Buczynski,). Another prominent discovery in neuroscience that is still getting attention is that of mirror neurons. Mirror neurons are “ smart cells”(reference) laying down inner depictions within our brain and possibly our bodies. Mirror neurons permit us to comprehend the actions, intentions and feelings of others. These neurons, held in many parts of our brains, fire not only when we perform an action, such as holding hands, but also when when see others perform actions. Mirror neurons are not limited only to action, they are also stimulated when we experience an emotion and when we visually perceive others experiencing an emotion, such as pleasure, sorrow or distress(Lacoboni, 2008). Within the neuroscientific community mirror neuron research in humans has been polemic, no one piece of evidence being categorically accepted as proof that mirror neurons exist within humans. This however does not detract from the plethora of evidence supporting mirror neurons in humans(Keysers & Gazzola, 2010) given technological reasons have thwarted the finding of individual mirror neurons(Vivona, 2009) supporting evidence has come from the electroencephalogram (EEG) recordings, behavioural experiments and transcranial magnetic stimulation (TMS) studies(Keysers & Gazzola, 2010). In short research has shown that mirror neurons exist somewhere in the human brain and are not restricted to premotor and inferior parietal cortex.

Research has also shown that certain neurons appear to have ‘ anti-mirror

properties. When these neurons work in combination with mirror neurons they could help the brain perform internal simulations of other peoples actions, simultaneously selectively blocking explicit motor output and remove ambiguities from who performed the action(Gallese, 2008)(Keysers & Gazzola, 2010).

Implications in psychotherapy

Neuroplasticity does not always espouse uplifting news; our brains may be more resourceful, but are also more susceptible to outside impacts . Neuroplasticity can produce more flexibility, but also more rigid behaviours, this is called the " plastic paradox"(Doidge, 2011, p. 6), some of our most tenacious habits and disorders are products of plasticity. Once a particular plastic change occurs and becomes well established, it can prevent other changes from from occurring. Considering both the positive and negative properties of plasticity help us understand the extent of human possibilities (Doidge, 2011).

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