NEUROPSYCHOTHERAPY IN AUSTRALIA

The neuroscience of talking therapies:

Implications for therapeutic practice

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Editorial

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Welcome to our last edition of the Journal for 2013 – Neuropsychotherapy in Australia.

We look forward to an exciting year in the domain of Neuropsychotherapy:

Workshops

Our four two-day workshops will run again in 2014 however the frequency will be much less due to research and international teaching commitments.

We are excited about the new workshop for 2014:

The Ageing Brain – Maximizing Wellness and managing challenges – a Neuropsychotherapeutic Perspective. This workshop will run in all major cities in Australia.

Pilot Study: Online Therapy

We will commence in the near future with the pilot study on the applications of online treatment for panic Disorder from a Neuroscience (bottom up) perspective. This approach is developed as an adjunct to clinician interventions and not a stand-alone tool (as is the case with almost all current online treatments). Nearly 500 clinicians have signed up to be involved in the randomised control trial. We are very excited about this project and will keep you posted on the progress.

Feature article

The feature article focuses on the changing paradigm of care- understanding the role of talking therapies in facilitating neural change.

Online Professional Development

Mediros is in the process of developing online Neuropsychotherapy Professional Development Modules. A series of one hour (1 PD point) professional development topics will be available soon – this will consist of a variety of topics in Neuroscience:

- Introductory video,
- Reading material related to the specific topic
- References for additional reading
- A brief questionnaire
- A PD certificate

I hope you will enjoy the read.

Pieter Rossouw

The neuroscience of talking therapies:
Implications for therapeutic practice*

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The effect of counselling has been a central focus for scientific study and discourse for many years. Recently, neurobiological research has provided a unique insight into the effect of enriched environments (among them – structured talking – counselling/therapy) in affecting the brain.

Since Nobel laureate, Eric Kandel proposed a new intellectual framework for psychiatry and psychotherapy, neurobiological research demonstrated the effect of talking therapies not only on behavioural change, thinking patterns or feelings but on neurochemical shifts, neural activity and even neuro-structural changes.

This paper explores recent findings in neuroscience and how these findings may shape the future of talking therapies. Neurobiological findings have generated a number of new perspectives regarding the therapeutic process. Four of the most profound aspects are:

- The emerging paradigm in understanding neural functioning.
- The changing paradigm in brain studies demonstrated a shift from the focus on the brain as an electro-chemical system to the brain as neural network system, thereby shifting the focus from chemical interventions as baseline therapy to enriched environments with talking therapies a key component.
- Neuroplasticity and the effect of talking therapies on changing brain functioning and brain strucre. Closely linked with these findings are new indicators regarding the role of antidepressant medication on neural function.
- The role of mirror neuron systems on the effects of counselling. Findings regarding the role of mirror neuron systems opened new perspectives into understanding what shapes human behaviour.
- The role of right brain to right brain activation linked with attachment and control patterns to facilitate change.

These perspectives have profound implications for talking therapies. Implications of these findings will be explored and how Counselling has become a central catalyst for effective therapeutic outcomes.

Introduction – a decade after the decade of the brain.

During the past 100 years significant scientific discoveries facilitated paradigm shifts in our way of being. Albert Einstein's theory of relativity demonstrated that time and space (entities that traditionally were seen as totally separate) are the same fabric (Einstein 1954). Louis de Broglie demonstrated that all matter (not just photons and electrons) has quantisized wave/particle duality which led to an new understanding of the interaction between the physical brain and the mind, and the effect of the mind on the brain, and the brain on the environment – the brain's ability to command the environment (and for that matter – the universe)(De Broglie 1960).

In 1990, the US Congress designated the 1990s the "Decade of the Brain." President George H. W. Bush proclaimed, "A new era of discovery is dawning in brain research." During the ensuing decade, scientists greatly advanced our understanding of the brain. In 1998 Eric Kandel stated: "we are in the midst of a remarkable scientific revolution, a revolution that is about to change the way we think about the brain and the mind" (Kandel 1998). In this article Kandel makes reference to possible neurochemical, neural structural and neural networks changes facilitated as result of – talking therapies! He refers to possible changes in neural hardware as result of the action of "neural machinery" in the "therapist's brain" on the "client's brain" (Kandel 1998). These were profound statements – especially as they were not demonstrated in research outcomes (yet). This

article of Kandel is often referred to as the most significant article published on the nature and future of psychotherapy since Freud's abandoned project in 1895 "project for a scientific Psychology". Kandel contributed significantly to the understanding of memory on neurocellular level and opened the field of cellular neuroscience to the field of psychotherapy. For his work he was awarded the Nobel Prize in Medicine and Physiology in 2000.

Kandel's work (2006; Kandel et al 2013) sparked researchers like Wayne Drevets (2001), Richard Davidson (2010), Richard Davidson and Susan Begley (2012), Olaf Sporns (2011), James Schwartz (Kandel et al 2013) and many others, contributed to the facilitation of a paradigm shift in understanding the brain – the shift from understanding the brain as an electro-chemical system to the brain as a network and the social properties of the brain – the interconnectedness of "us" (Rossouw 2011).

The brain as electrical system

The brilliant electrophysiologist Julius Bernstein found in 1902 that nerve cells have steady potentials (electrical charges) and that, even at a resting state, there is a difference in voltage between the inside and the outside of the nerve cell. This was one of the first indicators of the idea of the brain as an electrical system. Later research by Alan Hodgkin and Andrew Huxley confirmed this and linked the process to memory systems. This lead to the discovery of electroconvulsive therapy by Ugo Cerletti and Lucio Bini in 1938 (Shorter 2007). This form of treatment gained widespread use and is still used as treatment mode for many disorders (Rossouw 2013).

Focus on the chemical processes

Research by Henry Dale and colleagues indicated that the chemical acetylcholine acts as a transmitter of signals. It seems the basic operating system of the brain is not a purely electrical activation but electrochemical. Stephen Kuffler and the Australian John Eccles were the first to demonstrate how the release of acetylcholine gives rise and fully accounts for all phases of action potentials. This work facilitated a paradigm shift in understanding the function of the brain – the birth of the chemical model in understanding and treatment of the human brain – often referred to as the "medical model". Eccles was awarded the Nobel Prize in Physiology or Medicine in 1963. These discoveries changed the nature of treatment of the brain. A huge number of studies focused on chemical interventions to enhance neural functioning. In mental health the most profound of these studies was the discovery of the properties of compound that acts as an inhibitor of serotonin. The work at Eli Lilly in collaboration with Bryan Molloy and Robert Rathbun on an antihistamine diphenhydramine showed some antidepressant-like properties. Later another Lilly scientist, David Wong worked on derivatives to only inhibit serotonin and in May 1972 Jong-Sir Horng tested a compound that seems to be the most potent inhibitor of serotonin – later called fluoxetine (Prozac). The first article about fluoxetine was published in 1974 (Wong et al 1974; a twenty year follow up study was published in 1995 – Wong et al 1995). The drug appeared on the Belgian market in 1986. Final drug approval was given in 1987 – within a year sales in the USA alone reached $350 million.

Since 1978 a large number of related drugs have been introduced to the market with annual sales of USD 11 Billion in 2008. Thousands of research papers have been published indicating that the primary mode of intervention for people suffering from anxiety/depression is an anti-depressant - a Selective Serotonin Reuptake Inhibitor (SSRI). The medical model of psychiatric care – the focus on the brain as chemical system, became the preferred mode of delivery as a result of outcome based evidence (Rossouw 2013).

The guidelines in health circles were clear – the first line intervention for people suffering from baseline illnesses (all diseases with primary or co-related symptoms of depression and/or anxiety) is a chemical intervention (antidepressant medication).

Questions regarding the long term benefits of chemical interventions

Recently a number of research studies questioned the well-established notion that chemical interventions are helpful for the brain without detrimental effects. One group of medication that is widely used in many disorder presentations, the antidepressant group – in particular the second generation antidepressants – the selective serotonin reuptake inhibitors (SSRIs), was identified as group that may not be as beneficial for neural processes as previously thought. A recent study by Paul Andrews and colleagues states that the current medical model of prescribing antidepressant medication as a first line treatment modality for an array of conditions needs to be re-evaluated against current neuro-molecular evidence. The processes of regulating serotonin are

described by the authors in relation to one of the key principles of molecular science - that disruptions of evolved adaptations degrade biological functioning (Andrews et al 2012). The key role of serotonin in adaptation processes has been clearly established and accepted in neuroscience (Kandel 1976, Kandel 2001, Kandel 2005, Kandel et al 2013). Disruption of the role of serotonin may have adverse health effects. Inhibition of neurobiological actions (serotonin reuptake) causes morphological changes to neural structure resulting in higher risk of apoptosis (neural death). This means relapse rates will increase with prolonged intake of serotonin inhibition.

The authors argue that, contrary to the widely held belief that antidepressants promote production of brain derived neurotrophic factor (BDNF) and as such, neurogenesis, the method to detect this, 5-bromo-2'-deoxyuridine (BrdU), which detects DNAsynthesis, interprets this synthesis as indication of neurogenesis. However the researchers point out that DNA synthesis often occurs during the proses of apoptosis (neural death) and is most likely part of the cyclic-related cell death (Herrup et al 2004). More recently, sophisticated studies have found no evidence that antidepressants trigger neural growth (Kobayashi 2010). Conversely, Kobayashi foundthat Fluoxetine caused mature neurons to take on immature functional characteristics. Thus constant serotonergic input is needed to maintain the mature state of neurons. The implication is that long term inhibition of serotonin uptake may lead to much greater risk of relapse when inhibition discontinues (discontinuation of medication). This leads to a vicious cycle where the neural maturation will be compromised when medication continues and being compromised when it discontinues (the double loose –loop).

The emerging new paradigm - networks

The discovery of brain "wiring" was made during the 1940's by Donald Hebb. He suggested that "When an axon of cell A is near enough to excite cell B and repeatedly or persistently takes part in firing it, some growth process or metabolic change takes place in one or both cells such that A's efficiency, as one of the cells firing B, is increased" (Hebb 1949; Hebb 1961). This phrase is often referred to as "Hebb's law" and was popularized in the phrase "Neurons that fire together, wire together" (Grawe, Donati & Bernauer 1994). The more neurons fire in a specific sequence, the stronger the neural connections become (up-regulation of neural activity). This is an important process in brain development and assists with streamlining neural communication. The same principle applies to "looping" resulting in the formation of powerful (unhelpful) loops of neural firing.

Kandel's research on sea slugs (aplysia californica) demonstrated how neural communication can be explained on a cellular level. He also demonstrated how "hardwired" systems can change the direction of neural activation through activation from the environment. This works assisted the understanding of how genes express through interaction with the environment. The implication of this research is clear – the environment changes the brain. Kandel also demonstrated that the essence of neural functioning is not a chemical one but a network of connections. Freud's hypothesis that the subconsciousness (memory) is situated in the space between two neurons was in principle correct however recent research indicates it is a bit more complex. Kandel demonstrated that memory consists of the series of communication (networks) between neurons. These networks are constituted as patterns of behaviour, feelings thoughts – a complex pattern of firing that defines the "self". Experiences (good or bad) change these patterns and lead to new patterns of activation.

The key question is: can this process and formation of neural loops change? Does this mean that the sufferer of trauma or some pathology is doomed to experience the symptoms of discomfort forever due to the existence of these loops? Neurobiological research has demonstrated that new, effective neural pathways can be established (Rossouw 2011; Rossouw 2012). Neural imaging scans show how cortical blood flow shifts and new firing patterns emerge when, for example, a client is given specific instructions to think about or asked to write down his or her thoughts and consider possible solutions to the worries. These activities activate the left pre-frontal cortex, shift cortical blood flow into these regions and in the process establish new neural firing activity. This does not mean a one off intervention changes neural firing. It does activate new firing patterns. The difficulty is that the "old" firing patterns have become the "natural default" firing patterns and unless the new pattern is actively activated, the client will constantly drift back into the old firing patterns in day to day life.

To establish these new firing patterns and to assist these patterns to become stronger, ongoing activation is needed over a period of time. When new patterns are activated for a period of time (6-8 weeks),

the same Hebbian principle applies – "neurons that fire together, wire together" – a new neural pattern is established. This is the aim of a neuropsychotherapeutic process. Recently a number of researchers demonstrated the network principle of neural functioning (Sporns 2011, Davidson 2012, Schore 2012, Siegel 2010, Siegel 2012).

An essential aspect of the neural network theory is the role of avoid and approach patterns in neural firing to facilitate behaviour. These patterns interact in close proximity of each other as integral part of the limbic mirror neuron system (more about the mirror neuron system later). Both avoid and approach patterns play a major role in motivation – but the outcomes are significantly different – healthy development of these patterns form an essential cornerstone towards mental wellness (Spielberg et al 2012). Over activation of fear responses (especially during the first 10 months post birth) facilitates high activity in anterior cingulate areas resulting in excessive patterns of avoidance – the emergence of the anxious brain. The question arises: does this mean that the brain is hardwired to remain anxious or can change be facilitated and if yes, how?

Neuroresearcher Michael Merzenich, demonstrated another principle in molecular science "neurons that fire apart, wire apart" (Bao, Chang, Davis, Gobeske, Merzenich 2004). This principle demonstrates that, when neurons stop firing together (are not activated in a specific sequence) they "lose interest" in each other and align themselves apart. The synaptic strength becomes less and eventually neurons that use to attach become detached. The implications of this are significant. For people suffering from depression and/anxiety and experiencing significant neural loops this means that they can be assisted to establish new neural firing patterns and new neural activity. When those patterns are established and regularly activated, the old firing patterns not only will become the less preferred patterns, they will slowly start to get deconstructed due the principle of "neurons that fire apart, wire apart", resulting in less risk of "relapse" into the default patterns. Greater changes to the neural firing patterns occur when the new neural patterns are effectively established and activated on an ongoing basis..

Over the course of the last decade a significant number of studies have demonstrated changes in brain functioning, cortical blood flow and/or structural changes due to introduction of talking therapies. Arthur Brody and colleagues identified metabolic changes in patients with depression treated with interpersonal therapy (Brody et al 2001). Stephen Martin and colleagues identified blood flow changes in depressed patients treated with Interpersonal Therapy (Martin et al 2001). In one of the most profound studies on neural change, Thomas Furmark and colleagues demonstrated significant lasting changes in cerebral blood flow in patients with social phobia treated with Cognitive Behavioral Therapy in comparison to Citalopram (Furmark et al 2002). Goldapple and colleagues demonstrated the effect of Cognitive Behaviour Therapy on cortical-limbic pathways for patients with major depression (Goldapple, Segal et al 2004). Jan Prasco and colleagues demonstrated changes in regional brain metabolism in panic disorder through treatment with cognitive behavioural therapy (Prasco et al 2004). Kim Felmingham and colleagues identified changes in the anterior cingulate cortex and amygdala regions after cognitive behaviour therapy of posttraumatic stress disorder (Felmington et al 2007). Sidney Kennedy and colleagues demonstrated differences in brain glucose metabolism between CBT and chemical interventions through neuroimaging investigations. The investigation found that CBT and chemical interventions activate different neural regions (Kennedy et al 2007). Knut Schnell and Sabine Herpertz conducted fMRI studies on clients presenting with borderline disorders and found significant changes in the right prefrontal cortical regions as result of dialectic-behavioral-therapy (Schnell and Herpertz 2007). Julie Maslowsky and colleagues (Maslowsky 2010) used fMRI scans to identify neural correlates in adolescents presenting with generalized anxiety disorder and the effects of cognitive behaviour therapy on those neural systems. Manfred Beutel and colleagues demonstrated changes of brain activation in fronto-limbic patterns as result of short-term psychodynamic inpatient psychotherapy (Beutel et al 2010). Increased cortical inhibition was facilitated with problematic perfectionists through group CBT (Radu et al 2011) and multiple metabolite effects were recorded with MRSI as result of CBT interventions in pediatric obsessive-compulsive disorder (O'Neill et al 2012).

Although many studies have used cognitive therapies as mode of service delivery there is ample indication that all talking therapies (interpersonal therapy, dialectic behavioural therapy and others, short term psychodynamic therapy, behavioural activation therapy) facilitate neurochemical and neural network changes as they share a common denominator – being a talking therapy facilitated in a safe (enriched) environment (Rossouw 2011c; Rossouw 2012). Studies are currently conducted to compare

efficacy of these various modes of delivery.

Mirror neurons the brain and talking therapies

Mirror neurons are a class of neurons that were originally discovered in the premotor cortex of macaque monkeys. Researchers at the University of Parma, Italy found these neurons in the ventral premotor cortex that discharge in association with movements (Rizolatti, Fadiga, Gallese & Fogassi 1996; Gallese, Fadiga, Fogassi & Rizolatti 1996). More research followed and researchers found these systems in various areas of the brain as well as in the human brain (Kilner, Friston and Firth 2007; Yuan & Hoff 2008; Bastiaansen, Thioux & Keysers 2009; Cattaneo & Rizolatti 2009). Research also indicated the role of these systems in imitation, empathy, mind-reading and predicting actions (Iacoboni 2009; Cataneo & Rizolatti 2009). Many mental health disorders are directly linked to the mirror neuron system (MNS) (Yuan & Hoff 2008; Iacoboni 2009).

Initial models of explaining the MNS adopted a simplistic causality approach where the perceived action is followed by the motor action. In other words: motor actions can be triggered by perceived actions. It seems to answer the question: "Is it possible to understand the intentions of other people by simply observing their actions?" This is the classical mirror effect – we smile at a baby – and the baby smiles back. The actions of one person are mirrored by the actions of another. The observation of this system build on the brilliant observations by William James who claimed more than a century ago: every mental representation of a movement awakens to some degree the actual movement which is its object (James 1890).

Soon it became clear that the question still remains: "How can intentions be inferred through action observation?" This gave rise to more sophisticated investigation into the MNS. Take the example of a picture of someone in an operating theatre taking a scalpel (our MNS predicts the future – there will be a cut on the skin of a patient as part of an operation to heal). Now take the example of Dr Jekyll and Mr Hyde – same scene but in the first instance the scalpel is in the hand of Dr Jekyll – in the second scene the scalpel is in the hand of Mr Hyde. If the observer has no knowledge of the narrative of Dr Jekyll and Mr Hyde – the MNS fires in the same way in both scenes. If the observer has clear knowledge of the narrative of this one person with two personalities, the MNS fires in different ways. Intent seems to play a role.

To understand intent Rizolatti and Craighero suggested the following the following explanation which is rather simple (but non-trivial in terms of implementation): "Each time an individual sees an action done by another individual, neurons that represent that action are activated in the observer's premotor cortex. This automatically induced, motor representation of the observed action corresponds to that which is spontaneously generated during active action and whose outcome is known to the individual. Thus the mirror neuron system transforms visual information into knowledge" (Rizzolatti & Craighero 2004). The idea was proposed that visual information is transferred from deeper (limbic) regions toward the higher cortical regions and predictive coding runs in a bottom-up mode through (at least) two MNS's – the one residing in the parietal lobe and premotor cortex the premotor MNS and the other in the anterior mesial frontal cortex – the limbic MNS. Evidence of these systems was found in a number of neurophysiological investigations (electroencephalography, magneto encephalography and transcranial magnetic stimulation) (Rizolatti & Craighero 2004).

Understanding intention coding became a vital aspect of various aspect of MNS functioning – the hierarchical process of coding, predictive coding (goals, meaning and future) and understanding pathology (prediction error). These aspects hold significant implications for the psychotherapeutic process.

The hierarchical activation of the two MNS's indicating the superiority of neural activation of one system over the other. The more primitive limbic MNS is a robust system organised to enhance survival. The predictive coding network is established based on minimizing prediction error. Each level of the hierarchy predicts representations in the level below. On a neural level this resonates with the theoretical framework of Maslow – fulfilment of basic needs for survival supersedes higher cortical needs. Activation of this limbic MNS is not a pure genetic predisposition – the interaction of the infant with its environment sets the tone for expression of genetic indicators. The implications are clear – the infant needs an enriched, safe environment to express an effective circuitry for predictive coding. Violation of basic needs (attachment and safety – the key components to down-regulate ongoing fear based activations) facilitate a fear based predictive coding framework – the limbic MNS interprets external cues in relation to prior coded activations and within the (pathological) predictive coding framework – re-

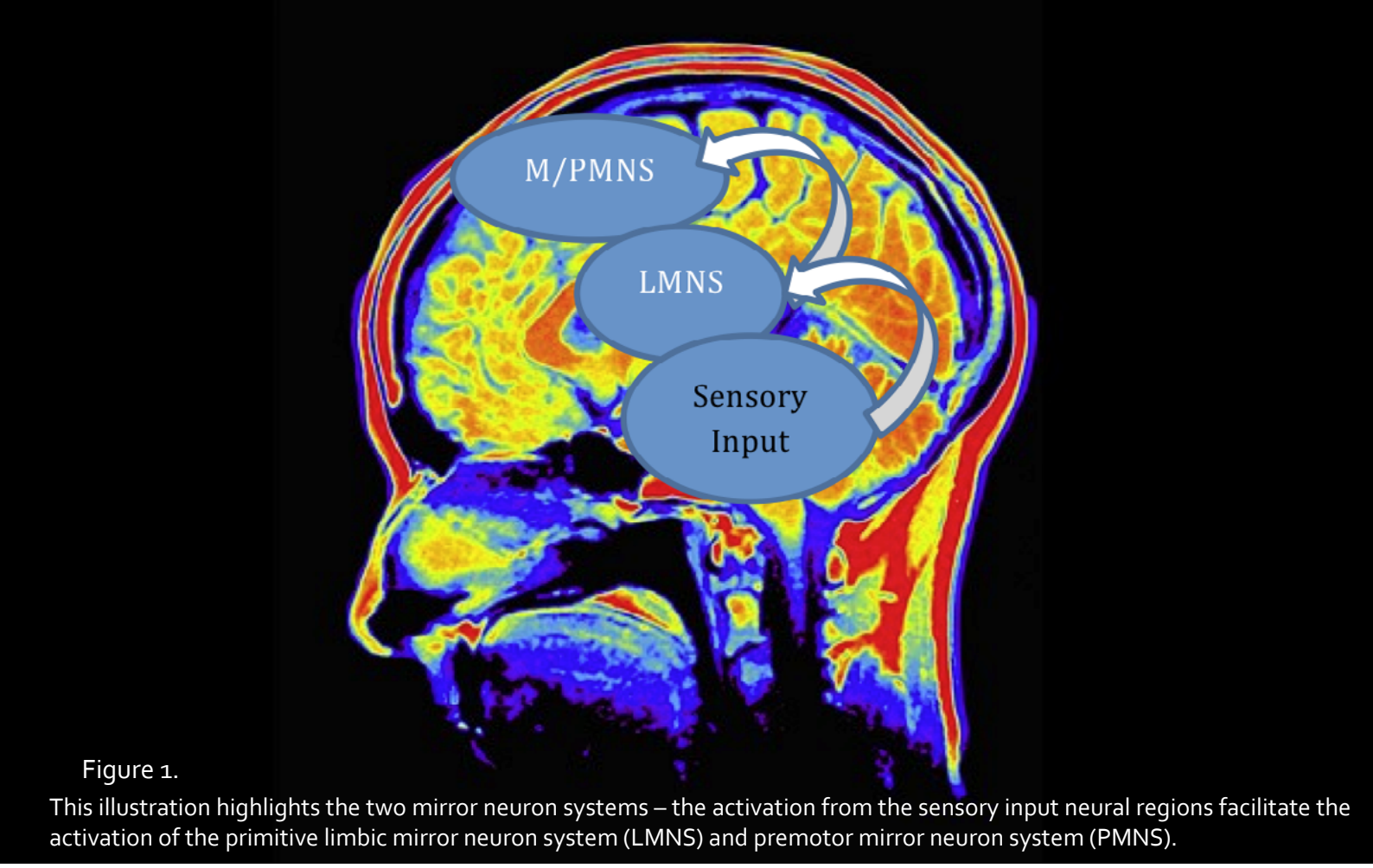

Figure 1.
This illustration highlights the two mirror neuron systems – the activation from the sensory input neural regions facilitate the activation of the primitive limbic mirror neuron system (LMNS) and premotor mirror neuron system (PMNS).

sponds towards signals (secondary MNS's) in a way to minimise error (the survival coding). The result is a neural system that maintains (and strengthen) its pattern of pathology (see figure 1).

Link with emotions

Why do we feel like crying when we see a loved one in distress? Why do we wince when we see someone hurting himself? Observation seems to activate a mosaic of not only motor or somasensory neural systems but also affective systems. These affective systems play a vital role in social functioning – including empathy, social learning and psychotherapy.

Evidence for mirror neuron systems in emotions were demonstrated by Bastiaansen, Thioux and Keysers (2009). Emotions of disgust and pain are primitive emotions closely related to the sensation of distaste and can be clearly identified through the connections from the basal ganglia, amygdala, anterior cingulate, anterior insula and orbito frontal cortex.

The function of these systems is (again) closely linked with the survival response. Predictive coding to minimize error is highly active and sets the tone for the establishment of key neural processes in the first 10 months post birth. Violations of basic needs (malnutrition, abuse, activates that compromise the quality of the enriched environment) trigger neural patterns of protection. The mirror effect of predictive coding strengthens this process resulting in strong (albeit unhelpful) patterns to minimize error (the need to survive).

The mirrors neuron system and therapy

The question arises: "What are the implications of the mirror neuron system(s) for therapy?" In other words: "To what extent need therapists be mindful of the role of the mirror neuron system and can the MNS be useful in any way to facilitate behavioural/neural change?"

The example of Dr Jekyll and Mr Hyde is applicable in this regard. The mirror neuron stimulus of a scalpel in a hand is interpreted in terms of intention (the perceived outcome in relation to prior activation – neural representation of prior experience. The handshake and a smile of a therapist meeting his/her client for the first time are (mostly) interpreted as friendly gesture to facilitate safety and the onset of a good therapeutic relationship. In a violated neural system the smile and reaching out of a hand may be interpreted as mirror representation of not being safe. The reality is that a clinician's intent and a client's mirror activation may not resonate the same response. This is because the intent of the action

activates different pathways in limbic alertness due to the expression of pathways in relation to prior experiences (especially early brain developmental exposures).

Neural plasticity

The notion that the neural structure is a fixed entity that only deteriorates in time as been disproven by many researchers over many decades. The concept of neural plasticity is linked to how synaptic potentials activate – neural connections are driven by the Hebbian principle of neural activation (neurons that fire together, wire together) or deactivation (neurons that fire apart, wire apart). Many factors play a role in neural activation and changes in neural activation (facilitated through neural plasticity). Davidson and McEwan (2012) demonstrated that social (environmental) influences play the most powerful role in neural plasticity. Environmental forces shape the neural activation patterns. These patterns adjust to maximise survival in the face of these environmental forces. The human brain responds on all levels from the most essential survival needs – oxygen, food, water, reproduction and shelter to the most complex needs such as enjoying a relaxing evening with family –through a tightly weaved network of neural connections. And if any of these needs on any level are compromised or violated, the connections change and from new patterns of firing. By far the most significant body of neural pathways are established prenatally and during the first 10 months post birth. Environmental needs of control and attachment have been identified as the most essential environmental variables to facilitate well-functioning (approach) neural patterns.

Although neural plasticity has been demonstrated right through life until death, the quality of plasticity decreases with age. It can also be compromised by nutrition, lack of exercise, smoking, sleep patterns, and many drugs – as these factors inhibit basic plasticity qualities and facilitate enhanced neural rigidity. Violations of basic needs, like trauma, up-regulate the fear response system and through the same plasticity ability, generate neural patterns of protection (the looping neural connections that maximises immediate survival and minimises problem solving) – these patterns are clearly demonstrated in fMRI and PET images.

The implications for therapeutic work are significant.

If neural plasticity is so powerful and neural systems have the ability to change their patterns of connection through the process of synaptogenesis and synaptoplasticity, the question arises: are there evidence based indicators to maximise neural plasticity and enhance the facilitation of strong, effective neural activation?

Neuroscience, talking therapies and the future: Indicators for evidence based practice

We are in the midst of the era post the decade of the brain. Although neural research is asking more and more profound questions and opening new worlds of information on a daily basis, we are also experiencing the era of neural application – applied neuroscience. No longer is neuroscience an isolated world of scientists locked in laboratories – neuroscience has come full circle in the interaction with its environment – the focus to enhance wellness of our society.

In 1998, Eric Kandel pointed out that we are in the midst of a remarkable scientific revolution – a revolution that is about to change the way we view our sense of being (Kandel 1998). This revolution is now indeed happening in terms of strategies to enhance wellness by using neurobiological information as psychotherapeutic tool.

Molecular neuroscience demonstrated how talking therapies are the preferred strategies to facilitate neural change. New patterns of neural activation can be facilitated through the unique qualities of talking strategies provided in an enriched environment. This is facilitated by effective activation of the mirror neuron systems, enhancing cortical blood flow to empower solution focused outcomes, and facilitating and strengthening new activation patterns to enhance long term patterns and reduce risk and relapse into default neural protection patterns. Research indicates that many different talking therapies can be effective to facilitate neural change. A meta-analysis (Grawe 2007) shows clearly that the single common denominator to facilitate change through talking therapies is the adherence to the principles of neuroanatomy. The key principles are the facilitation of limbic resonance through the activation of the primitive limbic mirror neuron system (LMNS); facilitation of safety (down-regulation of distress); enhancing cortical blood flow; addressing risk factors that enhance neural rigidity (lifestyle factors); strengthening of neural activation networks and facilitation of healthy social interactions.

Recent research clearly demonstrates that the human brain is not an isolated entity. It exists in relation to its environment. If all stimulation is discon-

tinued, the brain dies. The new paradigm of understanding the brain indicates that neuroscience is not a reductionist approach but an inclusive approach – the mirror neuron system is one of the most profound indicators of the interconnectedness of "us" (Rossouw 2011). The human brain is a social entity – its wellness depends on the quality of its connection with its environment. Talking therapies foster the microcosms of the new safe and secure social structure that facilitates the building of new healthy neural pathways.

Talking therapies are not magic cures. To foster new neural pathways of thinking, feeling, behaving and ultimately being, synaptoplasticity is activated to facilitate the communication of new neural networks. These networks are fragile and relapse to default patterns occurs easily. The challenge is to facilitate enough activation towards new patterns of firing for the default patterns to shift. This means a shift in glial activation to strengthen the new patterns - neurons that fire together wire (ultimately) together.

Cost effective interventions are key and significant debates arose regarding the health care system in countries like Australia where some rebates are available for certain services geven? on sliding scales for different services). Molecular neuroscience indicates that unless new patterns of thinking, feeling, doing and being identified in therapy are effectively facilitated, they are doomed to fail and relapse. This forces the health system deeper in to a crisis management model into which more resources are funnelled, with less focus on long term outcomes resulting.

Strengthening new neural patterns needs personal support (the mirror neuron effect) and regular activation (the homework effect). Internet based interventions have been proposed to enhance therapeutic outcomes. A current meta-analysis being undertaken at The University of Queensland demonstrates that almost all internet based models of service to reduce symptoms of pathology fail in terms of the basic principles of neuro-anatomy to facilitate lasting neural change. The exclusion of ongoing therapist –client interaction compromises the model.

At The University of Queensland in conjunction with the Queensland Brain Institute and key Neuroscientists around the world, we are working on internet based models to enhance facilitation of neural pathways through clinician based activation. The program will focus on strengthening the interventions used by practicing clinicians through interactive internet based activities that will be inclusive of the regular interventions of the therapist.This is currently in the experimental phase. The initial indicators look very promising and clinicians nation-wide will be introduced to these models soon.

Conclusion

In terms of psychotherapy, modern Neuroscience indicates that the person of the therapist is more important

than how much of a specialist he/she is, the knowledge base or the insight into bags of "tricks". Resent research indicates that the therapeutic alliance, limbic mirror neuron effect, facilitation of safety and control are more crucial to facilitate effective neural change that the above-mentioned variables. These qualities can be enhanced by better understanding of neural processes and evidence based practice. However, the opposite order (learning strategies and at a later stage attempting to add the mirror neuron effect) cannot be facilitated.

Mental health clinicians are indeed in the midst of an exciting era post the brain decade – the era of neural application. This is an exciting era where more than ever, Counselling has been identified as fundamental catalyst to facilitate and enhance wellness.

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Mediros Activities – 2013 – Overview

Mediros presented FOUR major two-day workshops on neuroscience in all major centres in Australia:

- The Developing Brain and the Neuroscience of Memory and Trauma
- The Brain and Anxiety – Utilizing Neurobiological Information as Psychotherapeutic Tool
- The Neuroscience of Depression – New opportunities for effective treatment and
- The Social Brain and the Neuroscience of Relationships

The TWO applied one-day skills classes / workshops ran in Brisbane, Sydney and Melbourne:

- Focused Neuropsychotherapy – applied strategies for the treatment of Anxiety and
- Focused Neuropsychotherapy – applied strategies for the treatment of Depression

Workshops were held for the Australian Psychological Society in

- Mornington Peninsula,
- Bathurst,
- Geelong,
- Mackay and
- Ballarat

International contacts:

- Pieter presented three workshops in New Zealand in 2013 – Christchurch, Wellington and Auckland and will run workshops in Dunedin, Auckland, Christchurch and Hamilton in 2014.
- A colleague from Texas visited us at the University of Queensland with 24 of her Master's students – they also attended a two-day Neuropsychotherapy workshop and an intensive one day applied Neuropsychotherapy workshop in Sydney

Other workshops:

Specialized workshops and training were provided for

- Queensland Ambulance Counselling service
- Queensland Police
- Victoria School Counsellors
- Queensland Mental Health
- STARTTS (Sydney)

Conference presentation on Neuropsychotherapy:

- Rossouw, P.J. (2013). The Neuroscience of talking Therapies: Implications for Therapeutic Practice (Keynote). APS National Counselling Conference. Melbourne, Victoria, Australia, 21-24 February.

- Rossouw, P.J. & Allison, K. (2013). The therapeutic alliance. Exploring the concept of "safety" from a neuropsychotherapeutic perspective. APS National Counselling Conference. Melbourne, Victoria, Australia, 21-24 February.
- Rossouw, P.J. (2013). Neuroscience and School Counselling – Clinical Interventions to Enhance Outcomes. (Keynote). Annual Catholic School Counselling Conference. Melbourne, Victoria, Australia, 10 May.
- Rossouw, P.J. (2013). The effects of bullying on the developing brain. Strategies for effective interventions. The No 2 Bullying Conference - Managing the Impacts of Bullying: Prevention, Policy and Practice. Surfers Paradise, Queensland, Australia, 22, 23 May.
- Rossouw, P.J. (2013). The effect of traumatic experiences on the brain. Implications for effective interventions. Counsellors Conference.QAS.Brisbane, Queensland, Australia, 6, 7 June.
- Rossouw, P.J. (2013). The impact of trauma on the developing brain. NSW Service for the Treatment and rehabilitation of Torture and Trauma Clinical Workshop, Sydney, NSW, Australia, 12 June.
- Allison, K & Rossouw, P.J. (2013). Brain based trauma intervention: The role of safety in facilitating an enriched therapeutic environment. The International Conference of Attachment and Trauma Informed Practice. Melbourne, Victoria, Australia, 13, 14 August.
- Rossouw, P.J. & Hatty, M.(2013). Continuing professional development in mental health professions: does it really make a difference? The 14th International Mental health Conference. Surfers Paradise, Queensland, Australia, 4-7 August.
- Rossouw, P.J. (2013). The neuroscience of interpersonal connectivity. Benchmarking strategies for effective interventions. National Anxiety and Depression Conference. Innovations in Clinical Practice and Research for Anxiety and Depression. Melbourne, Australia, 13,14 August.
- Rossouw, P.J. (2013). The neuroscience of helping. New directions in the teaching of counselling and psychotherapy. The 3rd Asia pacific rim International Counselling and Psychotherapy Conference, Sarawak, Malaysia, 16-19 August.
- Rossouw, P.J. (2013). The Interconnectedness of "us" – Neuroscience, mirror neurons and talking therapies. (Keynote). Australian Counselling Association National Conference. Surfers Paradise, Queensland, Australia. 26, 27 September.

Research

The book – ***BrainWise Leadership*** with Connie Henson and Pieter Rossouw was published in November 2013 (more details in this edition)

Articles

- Rossouw, P.J. (2013). The end of the Medical Model? Recent findings in neuroscience regarding antidepressant medication: Implications for Neuropsychotherapy. Neuropsychotherapy in Australia. 19,
- Rossouw, P.J. (2013). Childhood trauma and neural development. Indicators for interventions with special reference to rural and remote environments. Australia and New Zealand Mental Health Association.74-83.
- Rossouw, P.J. & Henson, C. (2013). A New Frontier. Neuroscience and the Workplace. Neuropsychotherapy in Australia. 20, 3-7.
- Rossouw, P.J. & Hatty, M. (2013). Continuing professional development in psychology: Requirements, assumptions, and the lack of evidence. Neuropsychotherapy in Australia, 20, 8-11.
- Rossouw, P.J. (2013). The neurobiological underpinnings of the mental health renaissance. The Neuropsychotherapist. 1 (1), 14-21. http://dx.doi.org/10.12744/tnpt(1)014-021
- Rossouw, P.J. (2013). The neuroscience of smiling and laughter. The Neuropsychotherapist. 1 (1), 106-107.
- Rossouw, P.J. (2013). Posttraumatic stress disorder and voluntary forgetting of unwanted memories.

An fMRI study. Implications and reflections. The Neuropsychotherapist. 21, 3-6.

- Rossouw, P.J. (2013). The neuroscience of talking therapies. Implications for therapeutic practice. The Australian Journal of Counselling Psychology. 13 (1), 40-50.
- Rossouw, P.J. (2013). The diagnosis of mental disorders. The DSM-5. Highlights and controversy. Neuropsychotherapy in Australia, 22, 4-7.
- Henson, C & Rossouw, P.J. (2013). Neuroscience and leadership, Neuropsychotherapy in Australia, July, August, 22, 8-10.
- Allison, K. & Rossouw, P.J. (2013). The therapeutic alliance: Exploring the concept of "safety" from a neuropsychotherapeutic perspective. International Journal of Neuropsychotherapy. 1, 21-29 doi: 10.12744/ijnpt.2013.0021-0029
- Kostyanaya, M. & Rossouw, P.J. (2013). Alexander Luria: Life, research and contribution to neuroscience. International Journal of Neuropsychotherapy, 1(2): 47-55. doi:10.12744/ijnpt.2013.0047-0055
- Rossouw, P.J. & Hatty, M. (2013). Continuing professional development in mental health professions: does it really make a difference? 14th International Mental Health Conference. Peer reviewed 126-145.

Research Projects

Six post graduate students completed their research in various aspects of Neuropsychotherapy under Pieter's guidance and graduated at The University of Queensland in December 2013:

- Kobie Allison - The therapeutic alliance: Exploring the concept of "safety" from a neuropsychotherapeutic perspective.
- Eloise O'Reilly – The impact of interactive online processes on psychological wellness: Implications on interpersonal responses to hypothetical situations.
- Christina Nguyen – The Impact of Technology Use on Couple Relationships: A neuropsychotherapeutic perspective.
- Micah Bernoff – A review of the effectiveness of computer-based interventions in Australia for anxiety-based disorders and reconceptualization of these interventions from a neuropsychotherapeutic focus.
- Gayle Moore – An analysis of perceived and actual coping capacity in new telephone crisis workers
- Jasmin Singh - Mum gets annoyed easily and we fight sometimes: an investigation of attachment styles and emotional disturbance in children's drawings

BOOK REVIEW

New Book release:

BrainWise Leadership.

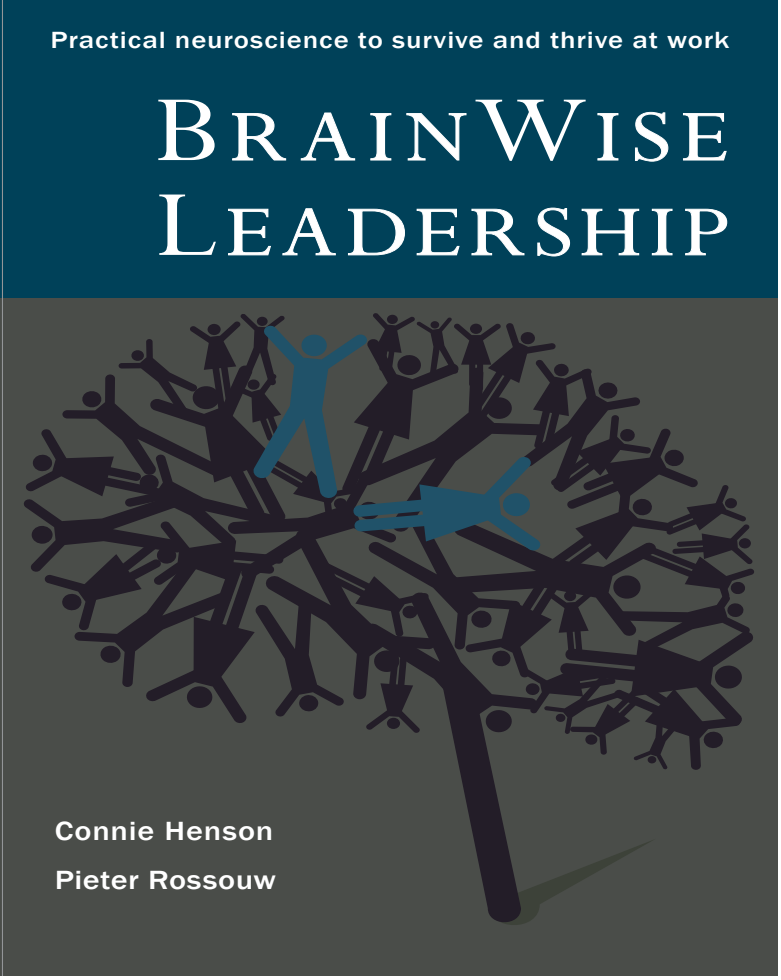
Practical Neuroscience to survive and thrive at work.

- Connie Henson and Pieter Rossouw

The challenge confronting today's leaders and their teams is making effective decisions in a marketplace where the goal posts continuously keep changing.

Using lessons from the latest neuroscience, BrainWise Leadership offers powerful insights and practical techniques that leaders can use to avoid common thinking traps and improve performance.

The authors translate complex neuroscientific concepts into layman's terms and provide real-life case studies to demonstrate how leaders can use the new techniques to best effect. The book is essential reading for both senior leaders and professionals involved in their development.



Comments

"The search for cost efficiencies and profits has created the most challenging business climate in a generation. Effective leadership in these difficult conditions requires an understanding of your team's individual thinking styles and behaviours. BrainWise Leadership provides you with those insights as well as a pragmatic, scientific set of tools for effective decision-making." Jim Mantle, Managing Director Australia and NZ, URS Australia

" One of the epiphanies I had while reading BrainWise Leadership is that change is fundamentally about learning: people know how to learn, and BrainWise Leadership provides new insights on how to help others do this more effectively so they can successfully navigate change. I also really enjoyed the real-life case studies and the practical tips with a scientific basis." Lesley Staples, Group HR Director for Toll Holdings

" Many aspects of modern life require a more sophisticated perspective based squarely on sound brain and behavioural sciences. In this book, the authors apply some of these key understandings to everyday management situations and demonstrate that when people use new insights from the brain sciences effectively, they are more likely to achieve the outcomes they desire." Professor Ian Hickie, Executive Director, Brain and Mind Institute

About the Authors

Pieter Rossouw is the Director of the Unit for Neuropsychotherapy and Mediros, a company that provides training in Neurobiology and Neuropsychotherapy. He is a member of the School of Psychology and the School of Social Work and Human Services at The University of Queensland.

Pieter has been in private practice for the past 25 years. Pieter holds Honours Degrees in Philosophy and Psychology, a Master Degree in Clinical Psychology and a PhD. Pieter is a member of the Australian Psychological Society, the APS College of Clinical Psychologists and the Queensland Counsellors Association. Pieter has been a Professor in Clinical Psychology at Universities in Canada, Holland and South Africa where he also spearheaded a Psycho-Therapeutic Assistance Program to support people exposed to trauma.

Pieter specializes in Neuropsychotherapy. He is a member of the Global Association for Interpersonal Neurobiology Studies, the International Society for Traumatic Stress Studies, the Australasian Cognitive Neuroscience Society, the Board of the Neuropsychotherapist, and is The Chief editor of the International Journal for Neuropsychotherapy. Pieter currently lives in Brisbane Australia.

Connie Henson is the Director of Learning Quest, an applied psychology and leadership development business. Her focus and expertise lies in helping people, organizations and communities to realize their strengths and abilities.Connie's PhD in Counselling Psychology is from the University of North Texas. She also has a Master of International Public Health from the University of Sydney, a Master of Science in Rehabilitation Counselling and a Bachelor of Arts in Psychology. Connie is a current member of the American Psychological Association, the Association for Psychological Science, the Australian Psychological Society, the Global Association for Interpersonal Neurobiology Studies and a graduate member of the Australian Institute of Company Directors.

The book can be ordered from Amazon:

http://www.amazon.com/BrainWise-Leadership-Practical-neuroscience-survive/dp/0987576607/

$25.95 Paperback (277 Pages)

$14.95 Kindle Version (325 Pages)

Neuropsychotherapy workshops 2014

MEDIROS CLINICAL SOLUTIONS

NEUROPSYCHOTHERAPY

Recent findings in Neuroscience demonstrated the unique role of talking therapies as enriched environment to facilitate changes in the brain. Neuropsychotherapy is the "language" used in the interaction between the clinician and the client to guide the client in the process of restructuring the brain towards higher levels of functioning and well-being. It uses information from neurosciences to assists clients suffering from a wide range of biological, psychological and social challenges to apply strategies to down regulate unhelpful neural stress responses and up regulate neural activation towards neural change. Understanding the neurophysiology of these disorders and activation patterns of neural pathways as well as discussing practical applications, assist clinicians greatly to apply more effective strategies to treat depression, anxiety and trauma.

WORKSHOPS

The Ageing Brain – Maximizing Wellness And Managing Challenges: A Neuropsychotherapeutic Perspective.

-6 CPD HOURS

1 November '14 Canberra
Calvary private hospital, Mary Potter Cct, Bruce

8 November '14 Adelaide
Hackney Hotel, 96 Hackney Rd, North Adelaide

15 November '14 Melbourne
Royal Melbourne Hospital, Grattan Street, Parkville.

21 November '14 Brisbane
Education Centre, RBW Hospital, Herston

28 November '14 Sydney
The Portside Conference Centre, 207 Kent Street

12 December '14 Perth
St Catherine's College, Uni WA, 2 Park Rd, Nedlands

The Brain and Anxiety. Utilizing Neurobiological Information as Psychotherapeutic tool.

-12 CPD HOURS

6,7 June '14 Melbourne
Royal Melbourne Hospital, Grattan Street, Parkville.

The Neuroscience of Depression. New Opportunities for Effective Treatment

-12 CPD HOURS

29,30 May '14 Sydney
The Portside Conference Centre, 207 Kent Street

The Developing Brain and the Neuroscience of Memory and Trauma

-12 CPD HOURS

12, 13 June '14 Brisbane
Education Centre, RBW Hospital, Herston

The Social Brain and the Neuroscience of Relationships

-12 CPD HOURS

21, 22 August '14 Sydney
The Portside Conference Centre, 207 Kent Street

28, 29 August '14 Brisbane
Education Centre, RBW Hospital, Herston

5,6 September '14 Melbourne
Royal Melbourne Hospital,

ABOUT THE PRESENTER

Dr Pieter J. Rossouw
MAPS; MCClin.; QCA.

Pieter is the Director of the Mediros Unit for Neuropsychotherapy – a company that provides training in Neurobiology and Neuropsychotherapy. He also teaches at the University of Queensland in the School of Psychology and the School of Social Work and Human Services. Currently he is involved in full time teaching and research in the fields of neurobiology and neuropsychotherapy as well as clinical training for clinicians, psychologists and general practitioners.

Pieter is a member of the Australian Psychological Society and the APS College of Clinical Psychologists. Pieter was a Professor in Clinical Psychology at in South Africa and also taught at Universities in Canada and Holland. He also spearheaded a Psycho-Therapeutic Assistance Program to support people being exposed to trauma. He provided Mental Health training for GP's for the Royal Australian College of General Practitioners. In Sydney (1999 - 2010) he worked as Senior Clinical Psychologist - Department of Health and he was the Clinical Director of both St John of God Psychiatric Hospitals (Burwood and Richmond).

Pieter specialises in Neuropsychotherapy and is an expert in anxiety and mood disorders. He has published 6 Scientific Books and 60 scientific articles. He has been involved in research in extensive clinical trials and presented research papers at 40 International Conferences worldwide. Pieter's latest book – BrainWise Leadership was published in Oct 2013 and is co-authored with Connie Henson. He is passionate about teaching – and in 2012 was the recipient of The University of Queensland Faculty of Behavioural Sciences prestigious award for Excellence in Teaching. He provides global leadership in counselling and is invited on regular basis as keynote speaker at leading international conferences.

He is a member of the Global Association for Interpersonal Neurobiology Studies, the International Society for Traumatic Stress Studies, the International Association for Family Therapy and the Professional Association for Drug and Alcohol Workers, the Australasian Cognitive Neuroscience Society and the Board of the Neuropsychotherapist with fellow researchers Allan Shore, Louis Cozolino, Todd Feinberg and Georg Northoff. He is the chief editor of the International Journal for Neuropsychotherapy and on the editorial board of The Neuropsychotherapist.

WORKSHOP VENUES

Sydney · Melbourne · Brisbane · Perth · Adelaide · Canberra

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2014 WORKSHOPS – TWO DAYS — Mark with X

The Brain & Anxiety: Neurobiological information as Psychotherapeutic Tool
Continuing Professional Development Hours - 12 hours specialised training

Melbourne	6 & 7 June 2014	Royal Melbourne Hospital, Grattan Street, Parkville	☐

The Neuroscience of Depression: New opportunities for Effective Treatment
Continuing Professional Development Hours - 12 hours specialised training

Sydney	29 & 30 May 2014	Portside Centre, Level 5, 207 Kent Street, Sydney	☐

The Developing Brain and the Neuroscience of Memory and Trauma
Continuing Professional Development Hours - 12 hours specialised training

Brisbane	12 & 13 June 2014	RBW Hospital, Herston Rd, Herston, Brisbane	☐

The Social Brain and the Neuroscience of Relationships
Continuing Professional Development Hours - 12 hours specialised training

Sydney	21 & 22 August 2014	Portside Centre, Level 5, 207 Kent Street, Sydney	☐
Brisbane	28 & 29 August 2014	RBW Hospital, Herston Rd, Herston, Brisbane	☐
Melbourne	05 & 06 Sept 2014	Royal Melbourne Hospital, Grattan Street, Parkville	☐

2014 - NEW RELEASE ONE DAY WORKSHOP — Mark with X

The Ageing Brain and Neuropsychotherapy

Continuing Professional Development Hours - 6 hours specialised training

Canberra	01 November 2014	Calvary Private Hospital, Mary Potter Cct, Bruce, ACT	☐
Adelaide	08 November 2014	Hackney Hotel, 96 Hackney Road, North Adelaide	☐
Melbourne	15 November 2014	Royal Melbourne Hospital, Grattan Street, Parkville	☐
Brisbane	21 November 2014	RBW Hospital, Herston Rd, Herston, Brisbane	☐
Sydney	28 November 2014	Portside Centre, Level 5, 207 Kent Street, Sydney	☐
Perth	12 December 2014	St Catherine's Coll, UWA, 2 Park Rd, Nedlands, Perth	☐

COST – TWO DAY WORKSHOPS

Early Bird rate (60 days prior)	$ 595.00	_____
Standard Rate	$ 645.00	_____
Student rate (copy of st card)	$ 495.00	_____
Group (4+, one payment)	$ 490.00	_____

COST – ONE DAY WORKSHOP – AGING BRAIN AND NEUROPSYCHOTHERAPY

Early Bird rate (60 days prior)	$ 395.00	_____
Standard Rate	$ 445.00	_____
Student rate (copy of st card)	$ 375.00	_____
Group (4+, one payment)	$ 370.00	_____

TOTAL COSTS: _____

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Neuropsychotherapy in Australia