From The Editor

Welcome to this edition of Neuropsychotherapy!

We are excited to share some significant developments in the field.

Certificate training in Brain Based Education.

In January 2016 I was appointed as adjunct professor at Central Queensland University – with specialisation in Brain Based Education. In collaboration with Prof Ken Purnell from the School of Education we developed four post graduate certificate courses in Brain based Education. The details are being finalised and the courses should be available from January 2017. These course will focus on the essentials of brain functioning, understanding the neuro-science of memory and how memory systems can be optimised in learning environments. These certificate will then be recognised as a tertiary certificate but can also be extended to a Master’s degree in Education. This is available for anyone with a bachelor’s degree (not only educators) and will be useful for school counsellors and other health professionals. The courses will be on offer online with limited face-to-face work. I will be directly involved in the courses. There is an expression of interest form attached in this journal – there is no obligation to enrol but we will keep you updated with the latest information as the courses are finalised. If you are interested then I strongly suggest you fill out one of these forms and fax / scan and mail to us as spots will be limited and there are a significant number EOI’s already received.

Research article

In this edition we publish a shorter version of a research project that was published in full in the International Journal of Neuropsychotherapy. The complete article with all research outcomes is available through the journal site (open access) – you can also follow the link:


The research open important perspectives on responses that affect wellness and assist clinicians to guide clients more effectively towards maximising wellness.

Certificate trainings

The first certificate trainings for clinicians are approaching very fast (Brisbane end of May and Bali in June). The Brisbane workshop is fully booked and there are only a few spots still available for Bali. We are also excited to announce that the training will also run in New Zealand (Auckland) in March 2017.

Other Neuroscience workshops

In the next few months I will run a Brain and Pain workshop in Sydney (27 May) and The adolescent brain workshop in Melbourne (14 and 15 July) and Sydney (28 and 29 July). Registrations are still open for these workshops.

International Conference Of Neuropsychotherapy - 2017

The first International Conference of Neuropsychotherapy will be held from 24-26 May 2017 in Brisbane. A special skills based pre conference workshop will be on offer on 23 May 2017. This is a very exciting project and 18 speakers are already lined up to present. Please flag this date in your diary. There will be details on the conference very soon and you will also be invited to submit abstracts, symposia or short/poster presentations of your work.

Enjoy the read!
Prof Pieter Rossouw
Internet-based Interactions and Psychological Wellness: Implications on Interpersonal Responses to Hypothetical Situations

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Pieter J Rossouw
MClin Psych, PhD, MAPS, MCCLLP, MQCA, MIACN

Summary

For many decades, it was thought that humans are born with hard-wired brains (unchanging over time; Arden, 2010). A simultaneous belief was that any neurological conditions an individual possessed manifested as outward conditions (for example, Alzheimer’s disease), not as psychological disorders (Arden, 2010). On the other hand, though, Kandel (1998) and Walter, Berger and Schnell (2009) suggest that psychological disturbances do have a neurological basis. This neurological basis can be altered by means of enriched environmental interactions, such as psychotherapy (Grawe, 2007; Siegel, 2001). This neural change is referred to as neural plasticity, the brain’s ability to change in response to developmental processes and experience (Huttenlocher, 2002).

The idea of neuroplasticity was first proposed by Sigmund Freud who believed that unconscious and conscious behaviour is organised and stored within the brain’s neural construction (Freud, 1968). Decades later, Erik Kandel (1998) initiated a new framework for thinking about psychology: that behaviour can be analysed through the integration of both social and biological determinants, suggesting there exists an interconnectedness between a person’s environment, genes and neural architecture in determining behaviour. Drawing from multiple theories, Kandel (1998) argues that all mental processes are derived from functions of the brain, that epigenetic processes play an important role in neural development and patterns of brain function, and that psychotherapy produces long-term changes in an individual’s behaviour through change in neural plasticity (altering synaptic connections), forming new neural pathways and, ultimately, changing behaviour.

Epigenetics and Neural Plasticity

Epigenetics looks at the interplay between genes and the environment (Kandel, 1998; Robinson, Fernald, & Clayton, 2008). Kandel (1998) challenged popular opinion by suggesting that genes are not unchanging vehicles which transfer hereditary information through generations, but that genes have dual functions: a template function (an exclusively organic process of replicating and transferring across generations), and a transcriptional function – or process (a function responsive to both organic development and environmental stimuli). This transcriptional process is responsive to unique
environmental interactions/stimuli and can result in altered gene expression where pre-existing neurons grow differently, changing neural pathways and ultimately, behaviour (Kandel, Schwartz, Jessell, Siegelbaum, & Hudspeth, 2013; Orphanides & Reinberg, 2002).

Research on rates of schizophrenia in monozygotic twins has lent support to epigenetic theory (Jang, Woodward, Lang, Honer, & Livesly, 2005; Kandel, 2006; McGuffin, Owen, & Farmer, 1995; Tsuang, 2000; Tsuang, Stone, & Faraone, 2001). These studies used genetically “comparable” participants to determine a genetic basis for schizophrenia, assuming that if one twin had the illness, so would the other. It was found (over many studies) that genetic factors are not the only determinants of the disease, but environmental factors significantly contributed to the disease’s etiology (Sullivan, Kendler, & Neale, 2003; Tsuang, 2000). These findings support that genes, responsive to both organic and environmental stimuli, are important determinants of neural construction that underpins behaviour (Kandel, 1998).

**Mirror Neurons**

The mirror neuron system has also been used to explain the effect of social interaction on wellbeing. Cozolino (2006) recognized the mirror neuron system – a class of premotor neurons that fire during the execution of a goal-orientated motor act and the observation of another performing the same or very similar act (Casile, Caggiano, & Ferrari, 2011; Rizzolatti & Craighero, 2004). This finding indicated that action observation is necessary for action understanding more so than action execution (Casile et al., 2011). In humans, this mirror neuron system is the mechanism which facilitates understanding the intentions behind another’s actions (Rizzolatti, Fabbri-Destro, & Cattaneo, 2009).

Furthermore, it is thought that mirror neurons are also an integral basis for expressing empathy. When empathy is expressed in a social interaction, the brain creates an internal state that resonates with the internal state of another individual (by way of the mirror neuron system), thus achieving a neural and cognitive connection between the two minds (Keeran, 2012; Siegel, 2006). This connection can facilitate a change in the neural software of the involved individuals such that one individual’s well-being can positively affect the well-being of another. Frequent exposure to such positive interactions results in more effective development of neural pathways and thus more effective patterns of well-being created for the individual (Rossouw, 2011). Antithetically, mirror neurons can respond to detrimental social interactions (for example, abuse) by developing dysfunctional neural networks and unhelpful patterns of behaviour, resulting in compromised well-being (Rossouw, 2011; Siegel, 2006).

**Neural Development in Specific Brain Regions**

Specific regions of the brain are particularly susceptible to changes in neural plasticity (Siegel, 1999). Whereas some brain regions (such as the brainstem and cerebellum) are mostly developed at birth, other parts of the brain, namely, the limbic system, develop at a slower pace and in response to external environmental interactions (Joseph, 1998). The limbic system is responsible for the experience of emotions and the formation of new memories (Siegel, 1998). A breadth of research has suggested that abnormalities in limbic system structures contribute to negative psychological well-being and pathology (Bremner, Narayan, Anderson, Staib, Miller, & Charney, 2000; Frodl et al., 2008; Grawe, 2007). For example, individuals with major depressive disorder have presented with significantly larger amygdala volumes suggesting consistent hyper-activation of this region (Frodl et al., 2008; Lange & Irle, 2004). This research points towards the deduction that without proper regulation of environmental stimuli by a person’s limbic system, defensive coping mechanisms may develop. That is, the development of unhelpful neural loops of behaviour or even pathology (Cozolino, 2010). Grawe (2007) describes this behaviour as approach- or avoidance-oriented responses, and Cozolino (2010) posits that these behaviours can result in psychological wellness or illness.

**Approach and Avoidance Orientation**

In response to the evaluation of a positive (safe) or compromised (unsafe) environment and the corresponding experience of emotion (through limbic system activation), an individual’s neural processes fire towards approach or avoidance goal motivation.
which informs behaviour (Cozolino, 2010; Grawe, 2007). Approach goals are associated with an enriched environment, the proliferation of neural synapses and reinforcement of positive neural patterns, developing helpful behavioural loops and promoting wellness. Avoidance goals serve to protect the individual if an environment has been evaluated as unsafe. Neural processes fire in such a way to promote survival, to protect from the experience of distress and thus inform avoidance behaviour (Grawe, 2007). If an individual consistently evaluates their environment as compromised (unsafe), neural patterns which underpin avoidance behaviour will activate more readily than patterns of approach behaviour, leaving the individual more susceptible to the development of unhelpful neural loops and defensive coping behaviour (Cozolino, 2010). Defensive coping behaviour (for example, aggression), albeit in the interest of personal survival, are costly to in individual’s well-being and can result in the emergence of pathology (Grawe, 2007).

The Internet as Social Environment

With 94% of Australians accessing the internet at home each day (Australian Bureau of Statistics, 2013), it is unsurprising that the internet has become an avenue for social interaction. Considering the significant demand the internet has on our social environment, as well as the role the environment plays in influencing the neural development of approach-avoidance goals then Internet-based interactions should also influence the development of behavioural responses via neural processes. Moreover, if the same rules surrounding anxiety apply to online interactions as they do with physical interactions, then it is expected that neuroplastic changes will occur lending itself to a reorientation of neural pathways beckoning avoidance behaviour and reinforcing psychological unwellness. Research investigating the impact of Internet use on psychological well-being has suggested that excessive Internet use is related to lowered psychological well-being (Chen, 2012; Kraut et al., 1998), increased feelings of depression, loneliness, and lower perceived self-esteem (Chen, 2012; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008), and increased levels of aggression and hostility (Guan & Subrahmanyan, 2009; Iacoboni, 2005; Yang, 2012). Such studies highlight that the

Internet provides a platform for social interaction which, through compromising interactions such as online bullying, may cause an individual significant distress, influencing neural development and reinforcing avoidance behaviour and ultimately decreasing psychological well-being.

Aim of the Study

There is a lack of research investigating the implications of Internet-based interactions on individual behaviour and well-being. The present study addresses this gap and aims to measure the influence of compromising (unsafe) Internet-based environments on psychological well-being and the development of unhelpful and avoidant behavioural patterns, specifically, the presentation of aggression. It was hypothesised that spending time engaging in negative Internet-based interactions will compromise participants’ psychological well-being (H1a), where general aggression will be influenced by engaging in negative online-based interactions (H1b). Finally, the tendency to respond aggressively to actual situations (physical) will also be influenced by engaging in negative online-based interactions (H1c).

Method

204 participants were recruited online and completed an online self-report questionnaire assessing five variables: time spent online; interactional experiences on social media (Facebook and/or YouTube); perceived psychological wellbeing; perceived aggression; and aggressive responses to five hypothetical situations. Interactional experiences on social media were defined as feeling abused or victimised, using coarse language, and engaging in an argument. The questionnaire was comprised of non-standardized measures and standardized measures, including the Buss-Perry Aggression Questionnaire – short form, the adapted BBC Well-being scale and the adapted Aggressive Provocation Questionnaire.

Results and Discussion

Correlational analyses were conducted on the data to observe any existing relationships between the
variables time spent online, experiences on social media, levels of aggression, psychological well-being, and aggressive responses to each of the five scenarios. The relationships observed will be discussed as they relate to the study’s hypotheses.

Hypothesis 1a.

The prediction that spending time online and engaging in negative interactions would compromise participants’ psychological wellbeing was partially supported. The study found that the more time participants spent on social media, the more likely they were to experience negative interactions. It was also revealed that the types of experiences participants were having online influenced psychological well-being, however this relationship was only found for feeling abused and victimised on social media, not for using coarse language and engaging in an argument. Previous research may lend an explanation for this finding in its suggestion that when an individual lacks control (for example, being the recipient of abuse or victimisation whilst online), anxiety and distress are experienced which can result in the lessening of well-being (Grawe, 2007). The other two negative Internet-based interactions, using coarse language and engaging in an argument, sees the participant exercising some form of choice or control in the situation.

Hypothesis 1b.

The prediction that participants’ general aggression would be influenced by engaging in negative online-based interactions was supported. It was found that participants who reported experiencing negative online interactions also reported having higher levels of aggression. A causal relationship cannot be interpreted between the variables (due to the correlational nature of the finding). However, in line with Cozolino (2010) and Grawe (2007), these participants may have developed neural patterns that reinforce their tendency to engage in avoidant behaviours (aggression) as a mechanism to protect themselves from the distress of experiencing negative online interactions.

Hypothesis 1c.

The hypothesis that participants’ tendency to respond aggressively to actual situations (non-online) would also be influenced by engaging in negative online-based interactions was unsupported. Results did show that participants who experienced feeling abused and victimised on Facebook were more likely to respond aggressively to the hypothetical scenario which included content about being abused on Facebook. It is possible, due to the crossover in content (feeling abused and victimised on Facebook and the hypothetical scenario about being abused on Facebook), that this finding can be attributed to participants, having halfway completed a survey asking them about their negative experiences on Facebook and their levels of aggression, being somewhat primed to respond aggressively to this particular hypothetical scenario. The same relationship was not found for those who had experienced feeling abused or victimised on YouTube, reinforcing the possibility that perhaps the Facebook-oriented hypothetical scenario primed participants’ responses.

Conclusion and Future Recommendations

The current study provides evidence that environmental Internet-based interactions influence psychological well-being. Though the results were not supportive of such Internet-based interactions informing avoidant behaviour, the study did provide a preliminary snapshot of the relationships between Internet-based based interactions and psychological well-being; thus furthering what is known about social Internet use and the implications of this for the well-being of the Australian population. The current study provides the necessary infrastructure for psychotherapeutic reform and paves the way for future investigations. One such example would be to implement functional MRI to examine the core neural networks involved in maintaining wellbeing whilst undergoing Internet-based interactions. Such information would be invaluable in the quest to promote individual well-being. In an ever so developing world where the internet is seen as an integral part of humanity, it seems only necessary that we adopt these technologies to advance e-medicine and therapies.

References


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2016 WORKSHOP SCHEDULE – Presenter Prof. Pieter Rossouw

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**VENUE AND DATE**

**PRICING FOR ALL VENUES ARE THE SAME - INCLUDING THE BALI VENUE - Training fee only - excluding travel and accommodation costs**

Payments can be made in instalments
- Early Bird rate (60 days prior) AUD $ 1,395.00
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BrainWise Leadership: Practical neuroscience to survive and thrive at work
by Dr C Henson and Dr Pieter J. Rossouw
268 pages 2013
$ 35.00

Neuropsychotherapy: Theoretical Underpinnings and Clinical Applications
by Dr Pieter J. Rossouw
457 pages 2014
$ 59.00

Think Lean Method: The whole-brain guide to get lean for life
by Jurie G. Rossouw
242 pages 2015
$ 55.00

Think Lean Fast: Healthy Living for Busy People
by Jurie G. Rossouw
102 pages 2015
$ 49.00

MiBrain Neuroscience Animation Series© Six animations - USB Format
*How the Brain Develops, *The Brain and Panic, *Depression and the Brain,
*OCD and the Brain, *Sleep and the Brain, *How the Brain Develops – Mandarin version
by Dr Pieter Rossouw
$ 39.00

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Graduate Certificate in Education
Specialisation - Brain Based Education

Central Queensland University

Graduate Certificate in Brain-Based Education

Brain-based Education (BBE) is a specialised domain in the field of Education. It focuses on the theory and practice of memory and learning from a neuroscience perspective. Key aspects of BBE are:

- **How the brain develops**
  The focus on the development of the neural networks is of essential importance in understanding practical pedagogical principles to enhance learning. Neuroscience opens new perspectives on neural development and points toward specific activations to enhance the development of neural networks.

- **The expression of genes**
  A clear understanding of the basic principles of epigenetics and how the environment can enrich or compromise neural development brings a new approach to education delivery.

- **Neural plasticity**
  The essence of education is the facilitations of learning. Learning is not a theoretical construct but the activation of neural networks. Understanding the complexities of learning but also unlearning bring much deeper insights into the challenges of learning difficulties and learning behaviours.

- **Memory and learning**
  BBE focuses on guiding educators to understand the neural basis of fear, support, overprotection, repetition, asking questions, social interaction, sleep, nutrition, exercise and many related aspects of the development of the neural networks towards a well-integrated socially responsible thriving person.

- **Learning and the environment**
  BBE focuses on a clear understanding of the neuroscience of safety (emotional, physical and regarding social systems). BBE will assist educators with clear guidelines to facilitate active learning (controllable incongruence) without compromising wellness. BBE links two domains (performance and wellness) into one paradigm of thriving learning.

- **Educational skills to maximise learning**
  BBE focuses on guiding educators to providing a safe, enriched environment to enhance neural proliferations. Specific skills are demonstrated to maximise learning.

Adjunct Professor Pieter Rossouw is a world leading neuroscientist. Pieter is the Director of Mediros Clinical Solutions, The BRAINGro Institute and The Neuropsychotherapy Institute – companies that provide training and conduct research in Neurobiology and Neuropsychotherapy. Pieter is also the President of The International Association of Clinical Neuropsychotherapy. Currently, he focuses on teaching and research in the fields of neurobiology and neuropsychotherapy as well as clinical training for clinicians, psychologists and general practitioners, as well as more recently for teachers and schools as well as Departments of Education in Brain Based Education. In his work Pieter does a lot of professional development with teachers and other professionals who have been requesting for some time for the possibility of completing formal studies in the area such as a Grad Cert. Pieter joined CQUniversity from The University of Queensland as an Adjunct in February 2016 and works closely with Professor Ken Purnell whose area of interest is in neuroscience and learning (Ken is a former Head of Education and ADLT, and his PhD in 1991 is from the UNSW in cognitive neuroscience).

The offering of the *Graduate Certificate in Brain Based Education* will be in the full Distance Mode as well as ‘supported distance’. This is to enable students to meet their contextual requirements from metropolitan city locales to rural and remote areas. To further support student learning it is intended to have one webinar each Term in each of the four courses provided by Pieter Rossouw.

This is an emerging area of opportunity to provide a qualification in Brain Based Education of the highest quality to meet current and near future market demands. Professor Ken Purnell form CQU School of Education will oversee the Project.
Graduate Certificate in Brain-Based Education

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