The Importance of Incorporating Neuroscientific Knowledge Into Counselling Psychology: An Introduction to Affective Neuroscience

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**Abstract: Content and focus -** Neuroscience as a whole has seen great advancements over the last couple of decades and as such, it is becoming an increasingly important and relevant knowledgebase for counselling psychologists to incorporate into their research and practice. Affective neuroscience focuses on the emotions and affect which are both produced and perceived by the brain and mind. Jaak Panksepp, a prominent figure within affective neuroscience, has suggested that one avenue which is ripe for advancement is the development of primary process understanding. This paper discusses primary brain processes as well outlining a number of introductory ways in which affective neuroscience could contribute to counselling psychology**.**

**Conclusions -**It is suggested that counselling psychologists are well placed to contribute to affective neuroscience research. Additionally, psychiatry is well placed to benefit and add to the body of knowledge within affective neuroscience therefore the present work proposes that the time is now for greater collaboration between counselling psychologists, psychiatrists and (affective) neuroscientists, contributing and working together with the aim of increasing understanding and the effectiveness of therapeutic interventions for our species’ mental health and development.

**Key words:** *counselling psychology, neuroscience, affective neuroscience, affective balance therapy (ABT), primary processes*

**Introduction**

I believe it could be advantageous for neuroscience to become a regular fixture in the knowledgebase and repertoire of counselling psychologists. Counselling psychology founds itself on recognising the value of a client’s inner subjective world (Woolfe, Strawbridge, Douglas, & Dryden, 2010) and this is something which is of importance and mainstay for the identity of the discipline. However, with the advent of advanced modern neuroimaging techniques (see Carter & Shieh, 2010) and continually developing models of human biological understanding, it is important that the world of counselling psychology, one that prides itself so much on wanting to delve deep into understanding clients and their associated thoughts, feelings and actions (Woolfe et al., 2010), ensures that it strives to parallel the contemporary developments being made in what could be described as the golden age of neuroscience. The aim of this paper is to highlight how affective neuroscience in particular can provide a huge contribution to counselling psychology practice *and* research, and how counselling psychology can equally return the favour and provide significant contribution and knowledge to support and advance the world of affective neuroscience.

**What is Neuroscience?**

Neuroscience is the study of the nervous system which though traditionally seen as a branch of biology, is contemporarily viewed as an interdisciplinary science incorporating knowledge from disciplines including psychology, medicine, philosophy, physics, computer science and biology, to name but a few (Ivey, D’Andrea, & Ivey, 2012). Whilst the peripheral nervous system is of great interest to neuroscientists, it could be suggested from a general review and consensus of available research literature that the primary focus of investigation is geared towards the central nervous system, compromising of the spinal cord and the brain (Bear, Connors, & Paradiso, 2007). Whilst it is not my intention to use the present work to enter into any great detail on the process by which the brain and its associated neurons operate (an intriguing subject for which there are copious amounts of textbooks), I will occasionally discuss items pertaining to neurons and areas of the brain, therefore a brief introduction is appropriate. The basic unit of the central nervous system is the neuron; these are specialised cells which allow the brain to communicate and operate through the reception, conduction and transmission of electrochemical signals; as electrical signals are conducted between neurons, a pathway is generally opened for the transfer of neurotransmitters and neuropeptides across synapses (small gap junctions between adjacent neurons) (Pinel, 2011). These neurotransmitters (e.g., dopamine, serotonin, epinephrine and norepinephrine) and neuropeptides (e.g., endogenous opioids) carry messages between neurons which generate biological reactions; these biological chemical reactions are what contribute to the various cognitive, behavioural, psychological and emotional outcomes and actions which people experience and exhibit as part of their everyday lives (Ivey et al., 2012).

There are a vast range of disciplines within neuroscience including cognitive, behavioural, social, cellular and molecular (for additional branches see Brain Technology and Neuroscience Research Centre, n.d.; Squire, 2013). In reality, each of these divisions can provide substantial support and information to the world of counselling psychology; however the focus for the present work is on the discipline entitled *affective neuroscience.*

**What is affective neuroscience?**

Affective neuroscience investigates the neural substrates relating to mood and emotion (Dalgleish, Dunn, & Mobbs, 2009). Davidson, Jackson and Kalin (2000) highlighted that in the mid-1990s, scientists placed an increasing importance on emotions for the basic tasks of survival and adaptation (e.g., Damasio, 1994; Ekman & Davidson, 1994). Emotion plays a crucial role in decision making, learning and memory, as well as critical action in the social environments (Davidson et al., 2000). Emotion is also highly involved in individual differences among people, playing an important role in the aspects of personality and function which are linked to susceptibility for psychopathology (see Davidson, Abercrombie, Nitschke, & Putnam, 1999). It was perhaps this period of increasing scientific recognition of emotions which galvanised affective neuroscience into a prominent discipline, with one figure arguably spearheading the field, Jaak Panksepp.

***Affective neuroscience and Jaak Panksepp***

Panksepp firmly believes research has shown that “the basic biological values of all mammalian brains were built upon the same basic plan, laid out in consciousness-creating affective circuits…concentrated in sub-cortical regions, far below the neo-cortical ‘thinking cap’ that is so highly developed in humans” (Panksepp & Biven, 2012, pp.1). In effect, the oldest parts of the human brain, buried deep below the huge neo-cortex specific to human beings, have striking similarities to other animal species and as such, animal research carried out alongside human studies provides reliable insight into how the human brain produces and operates affective experiences (for more information see Panksepp, 2005, 2011a/b). These sub-cortical structures include (but are not limited to), the brain stem (notably an area of the midbrain called the periaqueductal gray (PAG)), medial thalamus and hypothalamus, which connect to higher brain regions belonging to an area often referred to as the *limbic system* (which includes the amygdala, hippocampus, basal ganglia, insular cortex and cingulate cortex) (Panksepp & Biven, 2012). Figure 1 (below) highlights some of these key brain structures.



*Figure 1*. General locations of selected brain structures plotted onto a saggital slice of an MRI image. Software and MRI image obtained using BrainVoyager Brain Tutor software (http://www.brainvoyager.com/products/braintutor.html)

Panksepp utilises localized electrical stimulation of the brain (ESB) to demonstrate that animals, like humans, have inbuilt basic affective responses which are activated by these ancestral areas of the brain; these inbuilt affective responses form the *primary process* level, the raw affective base productions of human brains, involving processes belonging to the homeostatic, emotional and sensory requirements required for the survival and continuation of the organism (Panskepp, 2011a/b; Panksepp & Biven, 2012). S*econdary processes* involve learning and memory (i.e. conditioning and habits) whilst *tertiary processes* operate at the neo cortex level, involving cognitive executive functions, emotional ruminations and regulations as well as other higher working memory functions (Panskepp & Biven, 2012). From his work in both animal and human research, Panksepp determined seven basic affective systems which operate at a primary process level within humans (and other mammals); the seven systems are SEEKING, RAGE, FEAR, LUST, CARE, PANIC/GRIEF and PLAY, with capitalization used by Panskepp to highlight the primary nature of the systems (Panksepp 1998, 2011a/b; Panksepp & Biven, 2012). It is with these seven affective systems that I will aim to demonstrate the importance of incorporating affective neuroscience into counselling psychology. This will allow me to highlight the brain regions involved using a descriptive name (i.e., the seven affective systems) as opposed to potentially over facing the reader with a deluge of detailed brain anatomy and neurochemical information. For readers who wish enter into the specific details, Panksepp & Biven (2012) should be used as a reference text for each of the seven affective systems discussed.

**A quick interlude on brain and mind**

Placing brain and mind as separate entities was Descartes’ greatest error (Damasio, 1994). The two are intrinsic however they do hold separate positions; in short, the brain compromises the anatomical, physical structures housed within our skulls, whilst the mind compromises of the subjective experiences and image contents generated as a result of the processes and interactions of different brain regions (Damasio, 2011). Some counselling psychologists may view the study of the brain as a reductionist approach to human existence; however it is widely acknowledged by many neuroscientists that the mind belongs to the holistic, personal and subjective experiences of a person.

**What can affective neuroscience offer counselling psychology?**

At present, psychologists often focus on the tertiary level of the human mind, using therapies such as cognitive behavioural therapy (CBT) to delve into the higher order cognitive aspects of a client. However, by addressing the primary affective worlds of clients, counselling psychologists armed with their dual roles as counsellor *and* psychologist, are well placed to generate and implement through the foundations of both therapeutic models and neuroscientific information, a new wave of Affective Balancing Therapies (ABT’s) aimed at harmonising and balancing the emotional worlds of their clients, rather than just their thoughts (Panksepp & Biven, 2012). Counselling psychologists who do not wish to develop new forms of ABT’s will no doubt still gain an extra level of understanding within their work if they are to include an awareness of common affective neuroscience into their knowledgebase. It is important to note that I am not stating counselling psychologists do not presently focus on emotions; it is the *primitive primary level* of emotions which Panksepp & Biven (2012) are suggesting require particular focus through ABT’s and it is in this distinctive area of primary emotions that I am suggesting counselling psychologist can deepen their understanding. There are two key concepts counselling psychologists should keep in mind (and brain!); *brain plasticity* and *epigenesis.* Brain plasticity relates to research evidencing that the brain has an ability reproduce new neurons and create reorganisations of neural networks throughout its lifetime (Begley, 2007). Epigenesis relates to research demonstrating that although each human is born with genes which are sent straight into production and effect, the expression (activation) of many other genes depends on a persons’ environment and social experiences, which trigger the transcription of gene variations (Szyf, McGowan, & Meaney, 2008). Epigenesis is one way in which human personalities can shift and alter through the course of their life (Panksepp & Biven, 2012). These two factors are important underpinnings for how the work carried out by counselling psychologists can help a client’s brain and mind create new formations and connections through therapy and social environments. Below, a number of common psychological disorders are introduced with an accompanying summary describing a small portion of current affective neuroscience knowledge relating to each disorder. Within the summaries I will not discuss how counselling psychologists could use the affective neuroscientific information within their practise; this will be discussed at the end, once each disorder has been introduced. For each disorder, brain plasticity and epigenesis should be acknowledged.

***Depression***

Depression can occur when a person experiences sustained separation and loss, leading to a prolonged activation of the PANIC/GRIEF system and a diminished SEEKING system (Coenen, Schlaepfer, Maedler, Panksepp, 2011). The PANIC/GRIEF system is largely involved in social relations and attachments and is heavily concentrated with opioid peptide chemicals (Panksepp & Biven, 2012). These endogenous opioids and oxytocin are the major neurochemicals involved in social emotions and as such, facilitation of the brain’s opioid systems has been shown to alleviate many forms of severe depression (Bodkin, Zornberg, Lukas, & Cole, 1995). This highlights the importance of developing social relationships for clients suffering from depression, beginning with the client-therapist relationship (Cozolino, 2010). The opioid system is also involved in regulating a number of physiological functions including stress responses, gastrointestinal, respiration, endocrine and immune functions (Le Merrer, Becker, Befort, & Kieffer). Physiological symptoms such as these may help both the client and counselling psychologist to view a client’s depression as one potentially relating to issues surrounding social engagements. The SEEKING system (which has often been referred to as the brain reward system), is largely concerned with the innate drive for humans to carry out actions in the form of approach and exploratory behaviour, in the eternal quest to harness from their environment (Panksepp, 2011a/b). The psychological fatigue and drowsiness which can often accompany depression and lead to an individual seemingly ‘giving up’ has been shown to be correlated with excessive dynorphin-induced dysphoria which occurs from a suppression of the opioid SEEKING system (Knoll & Carlezon, 2010). These views present two slightly different perspectives on depression. The first relates to a client lacking social engagement whilst the second relates to a client lacking general motivation and drive. It is possible that a client’s presenting depression could relate to one or both of these perspectives.

On a slight side note from depression, it should also be noted that the dopamine SEEKING system plays a huge role in all sorts of addictions, notably drug addictions (Robinson & Berridge, 1993).

***PTSD***

From an affective neuroscience primary process point of view, the FEAR system plays a key role in PTSD (with RAGE and PANIC/GRIEF system also likely to be involved); the periaqueductal gray (PAG), amygdala and hypothalamus form significant brain region components of primary FEAR circuitry (Panksepp & Biven, 2012). Mobbs et al. (2007) demonstrated that when a fear provoking stimuli was positioned closer to a participant, associated brain activity shifted from the neo prefrontal cortex to the periaqueductal gray, suggesting that whilst the neo-cortex ‘thinking cap’ is useful in terms of fear prediction, it is the subcortical PAG which becomes the key player when raw affective primary processing of fear is required in the face of immediate danger. PTSD has been subject to a wide range of recent research, however for the present work, particular focus is on the primary affective states and brain region associated with PTSD. Eye Movement Desensitization and Reprocessing (EMDR) (see Shapiro, 1989) has become a popular treatment for PTSD over the last decade or so. One of the primary activities in EMDR is for a client to systematically retrieve traumatic memories, followed by therapist guided lateral eye movements (or other alternating movements such as hand tapping); this intervention is based on research proposing that the power of traumatic memories reduces and is reprocessed affectively and cognitively through bilateral stimulation (Shapiro, 2002). One theory as to why EMDR is successful in treating PTSD is related to *memory reconsolidation*. Research has shown that memories can be reconsolidated, notably in the lateral basal amygdala (a brain region involved with fear); in line with the concept of brain plasticity, memories can be retrieved and reprocessed both in affective and cognitive content (Nader & Hardt, 2009). This suggests that those suffering from PTSD can recall traumatic memories and through controlled processes such as EMDR, reconsolidate memories to achieve positive associated memory affect.

***Attachment***

There is an abundance of research and text relating to the integration of (affective) neuroscience, attachment and psychotherapy (e.g., Hart, 2008). Oxytocin and vasopressin are two neuropeptides which feature heavily in attachment (Coan, 2010). The dopamine based SEEKING system can be employed in the search for attachment and its neurochemical rewards, whilst the CARE and PANIC/GRIEF systems are involved in the regulation and inhibition of oxytocin, depending on the security and style of attachment (Coan, 2010; Panksepp & Biven, 2012). Kosfeld, Heinrichs, Zak, Fischbache, & Fehr (2005) demonstrated that oxytocin may also play an important role in human trust. Pleasurable experiences with an attachment figure can enhance dopamine and endogenous opioid production and transmission, which in turn, begin the production of memory consolidation via the hippocampus and amygdala, associated to salient stimuli (including sight, sound and auditory) such as a primary caregiver (Coan, 2010). The ventral tegmental area (VTA), a system involved in addiction, is also conditioned to the salient stimuli cues which increases motivation for an organism to seek or anticipate future experiences involving the cues; this increases feelings of pleasure, contributing to the creation of an *attachment behavioural system* which includes distress signs for separation and a sense of restored feelings of security when close proximity is restored with the salient stimuli cue, particularly in relation to mate bonding (Insel, 2003: Coan, 2010).

***Linking affective neuroscience and counselling psychology***

For the three sources of psychopathology above, there was no provision of specific ways in which the information provided could be specifically used by counselling psychologists. The intention was to merely highlight what is a minute portion of affective neuroscientific information available for the knowledgebase of counselling psychologists. With depression, it is possible that the information highlighted above could help counselling psychologists distinguish between specific forms of depression relevant to the presenting symptoms and associated neurochemical imbalances which could in turn lead to therapies that focus on specific neural processes, such as developing the socially engendered endogenous opioids through enhanced therapeutic relationship techniques or homework based tasks pertaining to increased client social interactions. For depression linked with the SEEKING system, clients may be encouraged to work on new tasks, hobbies, or anything else which the client feels may help encourage their approach and exploratory behaviour to harness from their environment. In PTSD, the knowledge of memory reconsolidation could lead to therapeutic techniques, additional to EMDR, which gear towards retrieving traumatic memories and reprocessing them so that they associate with positive affect. For attachment, those who are perhaps perceived as insecurely attached could also take part in therapies which focus on enhancing specific neurotransmitters and areas of the brain through social interactions. This would help strengthen and develop neural substrates specific to attachment and emotion disorders (Panksepp & Biven, 2012). It has been shown that the emotional quality of a therapeutic relationship is more important than the model of therapy used (Lambert & Barley, 2001). This suggests that the therapeutic relationship alone can be skilfully utilised as a support base to generate a portion of the positive neurochemical processing required to combat depression and attachment disorders. In turn, this could encourage a client to further engage in their social world and create the positive effective extra-therapeutic experiences which have been shown to play a key role in successful therapy (Lambert & Barley, 2001).

 The above information is but a rain drop of available literature for a whole range of psychopathologies and common mental health disorders. The aim of this paper is to ensure that any counselling psychologists who are perhaps wary or unaware of what affective neuroscience has to offer, are given an opportunity to dip their toes into areas of interest specific to their research and practice. It is from an initial awareness of affective neuroscience that counselling psychologists could choose how and where they would like to focus and deepen their neuroscientific understanding. At the same time as absorbing information from the affective neuroscience knowledge pool, counselling psychologists armed with an increased neuroscientific knowledgebase will be suitably placed to use their therapeutic experiences to contribute and collaborate with those (affective) neuroscientists working in an associated field of enquiry. Counselling psychologists are well placed to provide (affective) neuroscientists with the research questions which would be most relevant to clinical practice and development (Rizq, 2007). For example, from my own experience and introspection, I feel that the secondary processes (learning and memory) are vital players alongside the primary processes. I feel ABT’s should recognise and incorporate this; therefore my future research and reading will focus on gaining an understanding of secondary processes so that I can potentially liaise with (affective) neuroscientists to see how these primary and secondary processes integrate. Whilst the present work is not the place for a discussion on this topic, this is an example of how I, as a trainee counselling psychologist, can use my therapeutic and life experience to develop inquiry within the field of affective neuroscience.

It is important for counselling psychologists to continually develop their professional skills and knowledge (i.e., CPD) and by building up a strong foundation of knowledge in those affective neuroscientifc areas relating to their practice, counselling psychologists, counsellors and psychotherapists are giving both themselves and their clients the chance for strong effective therapeutic relationships and outcomes (Cozolino, 2010).

**Implementation**

So how can counselling psychologists begin and continue the process of incorporating affective neuroscience into their knowledgebase and practice? In some ways this will depend on the career position of a counselling psychologist. Whilst this paper is highlighting the importance of *affective* neuroscience, the reality is that the whole discipline of neuroscience can contribute greatly to the world of counselling psychology, hence the occasional use of bracketing when discussing (affective) neuroscience. For trainees and those studying on university professional doctorates, there is a fantastic opportunity to incorporate neuroscience into course syllabi, with affective neuroscience being a sub-discipline of an overall neuroscience module. It would appear through secondary information that there is currently progress being made on such an idea. For those who are further placed in their career, CPD events and training programmes are perhaps ideal. The Metatonia Institute (n.d.) currently offers courses on combining the worlds of person centered practice and affective neuroscience. There is also a wide range of literature available on the integration of psychotherapy and neuroscience (e.g., Viamontes & Beitman, 2006a, 2006b; Cozolino, 2010; Ivey et al., 2012). Though possibly outdated in parts of its neuroscientific theory, Corrigall & Wilkinson (2003) present a collection of papers which emanated from a UK Council for Psychotherapy conference on the subject of integrating counselling and affective neuroscience. Perhaps if counselling psychology and (affective) neuroscience become greater aligned, in time there will be British Psychological Society (BPS) accredited courses which provide a benchmark of qualification for counselling psychologists to achieve in respect of integrating (affective) neuroscience into their therapeutic work. At present, the incorporation of (affective) neuroscience into counselling psychology would perhaps best sit somewhere in the pluralistic philosophy discussed by Cooper & McLeod (2011). This paper is in no way intending to state that incorporating affective neuroscience is something counselling psychologists *must* do in order to offer the best possible resource to their clients, it is an option and something to add on to their overall body of knowledge. This ties in with the pluralistic philosophy that no one single approach is suitable for every client and psychologist in the world. The incorporation of (affective) neuroscience knowledge into therapy can align in the same ways that a pluralistic philosophy allows for the incorporation of different models of therapy (Cooper & McLeod, 2011) and eventually, ABT’s can provide some of those potential models for integration. Until full ABT models are developed, (affective) neuroscience is perhaps best situated in an eclectic approach, whereby “the therapist chooses the best or most appropriate techniques from a range of theories or models in order to meet the needs of each individual client” (McLeod, 2009, pp. 369). Whilst it is possible that some counselling psychologists hold reservation to a neurobiological view of therapy and human existence in general, it is equally possible that certain clients will also have preferences towards or away from neurobiological underpinnings of their lives. As such, there is a strong case for eclecticism and the pluralistic philosophy to be appreciated for those counselling psychologists who wish to incorporate (affective) neuroscience into their practise. Given the humanistic underpinnings of counselling psychology, some practitioners may argue that the inclusion of neuroscientific information leads to a reductionist view of the human subject and that this goes against the philosophy of counselling psychology. However, it is the very nature of counselling psychologies’ humanistic philosophical underpinnings which allow it to be so well placed, perhaps more so than any other applied psychological discipline, in bringing new and novel ideas to the field of (affective) neuroscientific inquiry. Whilst other applied psychological disciplines such as clinical and educational are historically associated with neuroscience research (e.g., autism, Moldin, Rubenstein, & Hyman, 2006), it is the importance of the subjective human experience underpinning the counselling psychology philosophy, which is perhaps the ripest avenue for enhancing an understanding of our species’. It would seem appropriate that studies of the human brain should rely heavily on the subjective and holistic experience of what it means to be human.

There are counselling psychologists and clients who may feel a neurobiological view conflicts with their belief systems, be it religious, spiritual or other. The aim of this work is not to convert people’s beliefs, it is merely to highlight the benefit that (affective) neuroscientifc information can bring to those counselling psychologists who wish to include it within their practise. Once again, this is where the pluralistic and eclectic approach can be of great value to counselling psychologists, allowing them to choose how much of an (affective) neuroscience input they utilise within their work. The mind and brain are intrinsic (Damasio, 2011); when counselling psychologists talk with clients, both parties use their brain. Therefore, it would seem that an understanding of the mind and brain, through (affective) neuroscience, can help a counselling psychologist enhance an understanding of the therapeutic relationship and subjective world of a client. It could be suggested that it would in fact be a slightly reductionist approach for a counselling psychologist to decide that (affective) neuroscience cannot contribute to counselling psychology; to not be open to the benefits of (affective) neuroscience based on its biological underpinning, would perhaps go against the holistic underpinnings of counselling psychology; “developments in neuroscience offer new insights and an enhanced understanding of brain function that it would be folly to disregard” (Woolfe et al., 2010, pp. 9).

**Ethics**

If counselling psychologists begin to increase their knowledge in the field of (affective) neuroscience, it is imperative that they ensure their practise is carried out in an ethical manner. The British Psychological Society (2009) ethical guidelines highlight the importance of respect, competence, responsibility and integrity in relation to psychological research and practice. With regards to respect and responsibility, counselling psychologists must make informed judgements about whether neuroscientific information may be detrimental to a client. For certain clients, the concept that depression is something relating to brain chemicals may lead them to feel helpless or dependent on medication. This is where competency and integrity is crucial, as the whole idea of integrating (affective) neuroscience with counselling psychology is to make therapy more effective. If a therapist is attuned to concepts such a brain plasticity and other elements which demonstrate how a client can overcome certain psychopathologies, they will then be better placed to use neurobiological information to help and psychoeducate a client’s development. Furthermore, incorporating (affective) neuroscience into counselling psychology does not necessarily mean that therapists then have to verbally share knowledge with a client, far from it. The increased knowledge can merely be used to generally inform practise and models for psychopathologies. For some clients, explaining attachment theory may be useful and for others, not so much. This does not mean that attachment theory is of no use for counselling psychology, it can still inform a therapist’s practise, even if they weren’t to disseminate any theory to a client. The same holds true for (affective) neuroscience theory and knowledge.

Those counselling psychologists who become integrated into the research field of affective neuroscience may also want to consider their views and input towards the ethics of animal testing, as a large portion of the affective research field involves animal research as a primary method of inquiry.

 Whilst neuroimaging is advancing each day, it would perhaps be ethical of this paper to highlight that it is still a young technology. There are many aspects of neuroimaging which are open to debate, namely whether its accuracy and depiction of brain activity are always valid representations (Beutal, Stern, & Silbersweig, 2003; Rizq, 2007). This suggests that there still remains a wide range of subjective interpretation within neuroscience research; therefore it is with an element of caution and curiosity that counselling psychologists should review neuroscience based information within their practice.

**Benefits of affective neuroscience knowledge outside of the therapeutic relationship: Integrating further with psychiatry**

Outside of the actual therapeutic relationship, affective neuroscience can also help counselling psychologists formulate decisions and reasons for the decisions they take in their job role. If working in multi-disciplinary teams (MDTs), as often the case in NHS settings, a counselling psychologist armed with neurobiological knowledge will perhaps increase their effectiveness and communication when working with psychiatrists and clinical psychologists. Not only will a biological understanding of the mind allow counselling psychologists to communicate and defend their views on what they perceive would be best for a client, but the knowledge will also allow the views of psychiatrists to be better understood by psychologists, which in turn, hopefully contributes to a greater MDT care system for clients.

The world of psychiatry and psychology continues to be in somewhat of a dynamic shift in relation to DSM V and the nature of categorical diagnosis (Wright, 2013). Many psychiatrists are exploring alternative avenues within their field, and affective neuroscience is one such avenue. The following are examples of psychiatrists currently involved in affective neuroscience.

Harrison and Critchley (2007) highlighted that affective neuroscience can be applied in psychiatry not only to develop the neurobiological understanding of mood disorders, but also to provide “a framework for understanding the neural control of interpersonal and social behaviour processes that underlie psychopathology” (p. 192). Harrison and Critchley (2007) continued to explain that by generating a coherent and conceptual framework, affective neuroscience is providing a detailed understanding of current therapeutic mechanisms, as well as driving development to new and novel forms of therapy (i.e., ABT’s). Dell'Osso, Berlin, Serati, & Altamura (2010) discussed specific neuro-chemicals and brain regions involved with borderline personality disorder (BPD), suggesting neuropsychobiological information could be used to improve the efficacy of clinical interventions and therapies for BPD. For those readers with a psychodynamic preference, Berlin (2011) recently discussed potential neural underpinnings of the dynamic unconscious. The research highlighted above demonstrates only a handful of the many psychiatrists involved in using (affective) neuroscience to develop both medical and therapeutic interventions for a range of psychopathologies. What a wonderful opportunity this is for counselling psychology to work alongside the field of psychiatry and develop together, mutually, in hope of enhancing our effectiveness for the treatment of psychopathology and well-being of our species’ mental health.

**Conclusion**

Neuroscience as a whole has seen great advancements over the last couple of decades and as such, it is becoming an increasingly important and relevant knowledgebase for counselling psychologists, counsellors and psychotherapists alike (Cozolino, 2010; Ivey et al., 2012). Neuroscience can be divided into numerous sub-disciplines, one of which is affective neuroscience. Affective neuroscience focuses on the emotions and affect which are both produced and belong to the brain and mind. Jaak Panksepp, a prominent figure within affective neuroscience, has suggested that one avenue which is ripe for advancement is the development of primary process understanding (Panksepp, 2011a/b; Panksepp & Biven, 2012). Primary processes are the raw affective systems and processes which underlie human behaviour, deep in the sub-cortical midline brain structures. These brain processes and structures sit below the cognitive neo-cortex and as such, would provide a different form of intervention to many of the prevalent cognitive based therapies, (CBT, DBT etc.). Counselling psychologists are well placed to implement new and novel affective balance therapies (ABT’s) aimed at addressing a rebalance of primary affective processes. Not only can counselling psychologists make use of affective neuroscience for their therapeutic work, but they can also contribute greatly to affective neuroscience through research and practise based experience, helping to drive the questions which affective neuroscientists seek to answer. Additionally, the world of psychiatry is equally open to affective neuroscience (e.g., Harrison & Critchley, 2007) and perhaps the time is right for counselling psychology (and indeed every other discipline of psychology), psychiatry and affective neuroscience to work collaboratively toward the aim of enhancing the understanding of our species, leading to highly effective therapeutic interventions for all ranges of psychopathology.

 Many psychotherapists and psychiatrists have begun the work of integrating their respective disciplines with affective neuroscience (e.g., Van Der Kolk, 2006; Viamontes & Beitman, 2006a, 2006b; Hart, 2008; Cozolino, 2010). The international society of neuropsychoanalysis (see www.neuropsa.org.uk) is a worldwide group compromising of psychoanalysts, psychologists (myself included), psychotherapists, psychiatrists and philosophers who are interested in bringing the worlds of neuroscience and psychoanalysis together. It is fair to say that there is a lot of interest and a lot of research being conducted between the worlds of psychology and affective neuroscience. It’s high time that the world of counselling psychology is firmly involved.

**References**

Bear, M. F., Connors, B.W., & Paradiso, M. A. (Eds.). (2007). *Neuroscience: Exploring the*

 *brain*. (3rd ed.). Baltimore, MD: Lippincott Williams & Wilkins.

Begley, S. (2007). *The Plastic Mind.* Retrieved from http://books.google.co.uk

Berlin, H. A. (2011). The neural basis of the dynamic unconscious. *Neuropsychoanalysis, 13,*

 5-31.

Beutel, M. E., Stern, E., & Silbersweig, D. A. (2003). The emerging dialogue between

 psychoanalysis and neuroscience: Neuroimaging perspectives. *Journal of the American*

 *Psychoanalytic Association, 51*(3), 773-801. doi:10.1177/00030651030510030101

Bodkin, J. A., Zornberg, G. L., Lukas, S. E., & Cole, J. O. (1995). Buprenorphine treatment

 of refractory depression. *Journal of clinical psychopharmacology, 15*, 49-57.

Brain Technology and Neuroscience Research Centre (n.d.). What is neuroscience. Retrieved

 6 November, 2013, from http://www.btnrc.org/about-neuroscience/what-is-neuroscience/

British Psychological Society (2009). *Code of Ethics and Conduct*. Retrieved from

 http://www.bps.org.uk/sites/default/files/documents/code\_of\_ethics\_and\_conduct.pdf

Carter, M., & Shieh, J. (2010). *Guide to research techniques in neuroscience*. Retrieved

 from http://books.google.co.uk

Coan, J. A. (2010). Adult attachment and the brain. *Journal of Social and Personal*

 *Relationships, 27*(2), 210-217.

Coenen, V. A., Schlaepfer, T. E., Maedler, B., & Panksepp, J. (2011). Cross-species affective

 functions of the medial forebrain bundle - Implications for the treatment of affective pain

 and depression in humans. *Neuroscience and Biobehavioral Reviews, 35*(9), 1971-1981.

 doi: 10.1016/j.neubiorev.2010.12.009

Cooper, M., & Mcleod, J. (2011). *Pluralistic counselling and psychotherapy*.

 London: SAGE.

Corrigall, J., & Wilkinson, H. (Eds.). (2001). *Revolutionary connections: Psychotherapy*

 *and neuroscience*. Retrieved from http://books.google.co.uk

Cozolino, L. (2010). *The neuroscience of psychotherapy: Healing the social brain* (2nd ed.).

 Retrieved from http://books.google.co.uk

Dalgleish, T., Dunn, B. D., & Mobbs, D. (2009). Affective neuroscience: Past, present, and

 future. *Emotion Review, 1*(4), 335-368. doi:10.1177/1754073909338307

Damasio, A. (1994). *Descartes' error: Emotion, reason, and the human brain*.

 Retrieved from http://books.google.co.uk

Damasio, A. (2011). *Self comes to mind: Constructing the conscious brain*. London: Vintage.

Davidson, R. J., Abercrombie, H. C., Nitschke, J., & Putnam, K. (1999). Regional brain

 function, emotion and disorders of emotion. *Current Opinion in Neurobiology*, *9*, 228-234.

Davidson, R. J., Jackson, D. C., & Kalin, N. H. (2000). Emotion, plasticity, context, and

 regulation: Perspectives from affective neuroscience. *Psychological Bulletin*, *126*(6), 890-

 909. doi:10.1037/0033-2909.126.6.890

Dell'Osso, B., Berlin, H.A., Serati, M., & Altamura, A. C. (2010). Neuropsychobiological

 aspects, comorbidity patterns and dimensional models in borderline personality disorder.

 *Neuropsychobiology, 61*(4), 169-179. doi:10.1159/000297734

Ekman, P., & Davidson, R. J. ( Eds.). ( 1994). *The nature of emotion: Fundamental*

 *questions*. New York: Oxford University Press.

Harrison, N. A., & Critchley, H. D. (2007). Affective neuroscience and psychiatry**.** *The*

 *British Journal of Psychiatry, 191,* 192-194. doi:10.1192/bjp.bp.107.037077

Hart, S. (2008). *Brain, attachment, personality: An introduction to neuroaffective*

 *development*. Retrieved from http://books.google.co.uk

Insel, T. R. (2003). Is social attachment an addictive disorder?. *Physiology & Behavior,*

 *79*(3), 351-357. doi:10.1016/S0031-9384(03)00148-3

Ivey, A. E., D’Andrea, M. J., & Ivey, M. B. (2012). *Theories of counseling and*

 *psychotherapy: A multicultural perspective*. Retrieved from

 http://www.sagepub.com/upm-data/40557\_2.pdf

Knoll, A. T., & Carlezon, W. A. Jr. (2010). Dynorphin, stress, and depression. *Brain*

 *Research, 1314, 56-73*. doi:10.1016/j.brainres.2009.09.074

Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin

 increases trust in humans. *Nature, 435*, 673–676.

Lambert, M. J., & Barley, D. E. (2001). Research summary on the therapeutic relationship

 and psychotherapy outcome. *Psychotherapy: Theory, Research, Practice, Training*, *38*(4),

 357-361. doi:10.1037/0033-3204.38.4.357

Le Merrer, J., Becker, J. A. J., Befort, K., & Kieffer, B. L. (2009). Reward processing by the

 opioid system in the brain. *Physiol Reviews, 89,* 1379–1412.

 doi:10.1152/physrev.00005.2009

Metatonia Institue (n.d.). Affective neuroscience & attachment processes: Considerations

 for person-centred practice. Retrieved 27 November, 2013 from

 http://www.metanoia.ac.uk/workshops/PC+RTU/Affective+Neuroscience.htm

McLeod, J. (2009). *Introduction to counselling* (4th ed.). Retrieved from

 http://books.google.co.uk

Mobbs, D., Petrovic, P., Marchant, J. L., Hassabis, D., Weiskopf, N., Seymour, B.,

 Dolan, R. J., & Frith, C. D. (2007). When fear is near: Threat imminence elicits prefrontal

 periaqueductal gray shifts in humans. *Science, 317*(5841), 1079-1083.

Moldin, S. O., Rubenstein, J. L. R., & Hyman, S. E. (2006). Can autism speak to

 neuroscience?. *The Journal of Neuroscience, 26*(26) 6893-6896.

 doi: 10.1523/JNEUROSCI.1944-06.2006

Nader, K., & Hardt, O. (2009). A single standard for memory: the case for

 reconsolidation. *Nature Reviews Neuroscience*, *10*(3), 224-234. doi:10.1038/nrn2590

Rizq, R. (2007). Tread softly: counselling psychology and neuroscience. *Counselling*

 *Psychology Review, 22*(4): 5- 18.

Robinson, T. E., & Berridge, K. C. (1993). The neural basis of drug craving: An incentive

 sensitization theory of addiction. *Brain Research Reviews, 18*(3), 247-291.

 doi:10.1016/0165-0173(93)90013-P

Panskepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*.

 Retrieved from http://books.google.co.uk

Panksepp, J. (2005). Affective consciousness: Core emotional feelings in animals and

 humans. *Consciousness and Cognition, 2005, 14*, 30-80.

 doi:10.1016/j.concog.2004.10.004

Panksepp, J. (2010). Affective neuroscience of the emotional BrainMind: evolutionary

 perspectives and implications for understanding depression. *Dialogues in Clinical*

 *Neuroscience, 2010, 12*(4), 533-545.

Panksepp, J. (2011a). Cross-species affective neuroscience decoding of the primal

 affective experiences of humans and related animals. *Plos ONE*, *6*(9), 1-15.

 doi:10.1371/journal.pone.0021236

Panksepp, J. (2011b). The basic emotional circuits of mammalian brains. Do animals have

 affective lives? *Neurosciences & Biobehavioural Reviews, 35*, 1791-1804.

 doi: 10.1016/j.neubiorev.2011.08.003

Panksepp, J., & Biven, L. (2012). *The archaeology of mind: Neuroevolutionary origins of*

 *human emotions.* New York: W. W. Norton.

Pinel, J. P. J. (2011). *Biopsychology* (8th ed.). Boston: Pearson.

Shapiro, F. (1989). Efficacy of the eye movement desensitization procedure in the treatment

 of traumatic memories. *Journal of Traumatic Stress, 2*(2), 199-223.

Shapiro, F. (2002). EMDR 12 years after its introduction: Past and future research. *Journal*

 *Of Clinical Psychology*, *58*, 1-22.

Squire, L.R. (2013). *Fundamental neuroscience.* Retrieved from http://books.google.co.uk

Szyf, M., McGowan, P., & Meaney, M. (2008). The Social environment and the epigenome.

 *Environmental and Molecular Mutagenesis, 49,* 46-60. doi:10.1002/em.20357

Van Der Kolk, B. A. (2006). Clinical implications of neuroscience research in

 PTSD. *Annals Of The New York Academy Of Sciences*, *1071*(1), 277-293.

 doi:10.1196/annals.1364.022

Viamontes, V.I., & Beitman, B.D. (2006a). Neural substrates of psychotherapeutic change

 part I: The default brain. *Psychiatric Annals, 36*, 225-237.

Viamontes, V.I., & Beitman, B.D. (2006b). Neural substrates of psychotherapeutic change

 part II: Beyond default mode. *Psychiatric Annals, 36*, 238-247.

Wright, L. (2013, March 15). The DSM-V controversy [Online newsletter article]. Retrieved

 from http://www.openminds.com/market-intelligence/intelligence-updates/031513-dsm-v-

 controversy.htm

Woolfe, R., Strawbridge, S., Douglas, B., & Dryden, W. (Eds.). (2010). *Handbook of*

 *counselling psychology* (3rd ed.)*.* London: SAGE.