Neuropsychotherapy as an integrative framework in counselling psychology: The example of trauma.

Abstract.

Purpose – This article sets out to describe the neuropsychotherapeutic perspective, and to illustrate its application to psychotherapy through the example of trauma.

Methods – A number of recent publications which present different aspects of the neuropsychotherapeutic perspective are discussed. How such perspectives might help our understanding of trauma is then considered. The authors illustrate the points they seek to make through the description of four recent cases which arose in the clinical work of the middle author.

Results / findings – It is suggested that a number of dilemmas which are evident in the trauma literature, for example delayed onset and lack of universal susceptibility, can be explained through the comprehensive integrative framework offered by the neuropsychotherapeutic approach. In particular, notions of representational space can explain why some clients struggle to integrate traumatic memories into their elaborated long term memory structures.

Discussion / conclusions – The neuropsychotherapeutic perspective seeks to make use of principles and findings from neuroscience to inform research and practice in psychotherapy. Given the current prominence of neuroscience within psychology, this may be a theoretical framework to which many counselling psychologists are able to relate. It is suggested that such an approach could be very fruitful in helping us to conceptualise the issues and processes which arise in psychotherapy. It may allow researchers to make novel and detailed predictions about client issues such as trauma, leading to productive avenues for future research.

Key words: psychotherapy neuroscience, neuropsychotherapy, trauma, representation

Overview of the neuropsychotherapy perspective.

The term " neuro psychotherapy" has come to be associated with two distinct enterprises. The first is the conduct of psychotherapy with clients that have a neurological condition such as head injury, stroke, dementia or multiple sclerosis. There are a number of texts which can guide practitioners who wish to work in this area such as Ruff and Chester (2014) and Laaksonen (2013). Both of these are relatively recent publications and give excellent overviews of the issues and challenges in working with these client groups. The second main sense in which the term is used is in relation to the application of knowledge and findings from neuroscience to the practice and understanding of psychotherapy in mainstream settings. Within this endeavour two clear strands are evident in the literature. First of all there are texts such as Monzée (2009) and Cozolino (2010) which detail findings from neuroscience and suggest how these can inform and explain issues in psychotherapy. Cozolino (2010) for example describes the current research findings on trauma and how this impacts the brain, and then goes on to suggest how this knowledge can help us to understand and develop psychotherapeutic approaches to this condition. The second strand within this literature also

considers findings such as these from neuroscience, but then goes on to suggest how this knowledge can be used to specifically guide and structure psychotherapy in singular cases. In this sense, neuropsychotherapy could be seen as a new form of integrative psychotherapy in its own right. Such an approach was first elaborated at length by Grawe (2007). A more recent text by Rossouw (2014) includes contributions from a number of authors who work from this perspective.

Figure 1 about here.

At the heart of Grawe's (2007) approach is a model of human motivation and behaviour. An illustration of the model can be found in figure one. According to Grawe's (2007) consistency-theoretical model of mental functioning, human beings are driven by a number of basic needs which they strive to fulfil. Grawe bases this on recent views of personality (see Deci and Ryan, 2000, for example). The model puts forward four basic needs in particular. These are orientation/control, pleasure/avoidance of pain, attachment need and need for self enhancement. People then strive to satisfy these basic needs. Overtime, people will build up a repertoire of behavioural patterns which will tend to guide their activities as they attempt to meet their basic needs. According to Grawe, these patterns of behaviour can be characterised through two distinct tendencies. Some patterns will be dominated by approach strategies. So for example, someone feeling lonely and wishing to satisfy their attachment needs might seek to put themselves in a position where they can meet other people and begin new relationships. Other patterns may be dominated by avoidance. In this last example the same person might experience acute anxiety when meeting new people, and therefore tend to avoid such situations in order not to provoke this negative feeling. At the same time this avoidance then conflicts with their striving for attachment and relationship with others. This last point illustrates another feature of Grawe's model, in that multiple separate processes can be in conflict with each other, creating an overall tension or "discordance" within the system. Furthermore, such "discordance" within the system may be linked to the situation where a person's basic needs are not being met, a condition labelled as "incongruence". Grawe suggested that the existence of discordance and incongruence has implications for mental health. This is because a person's basic needs are not being met, despite motivational schemas being activated, and the striving to meet our basic needs tends to be accompanied by strong emotions.

In discussing how multiple mental processes occurring simultaneously will interact with each other, Grawe points out that this is rarely explicit in most psychological theories. This is despite the fact that this would be widely accepted by psychologists. He points out that the exception to this is in the area of connectionist models within the domain of artificial intelligence. Applying such models is likely to appear over reductionist and unpalatable to many practitioners within the field of psychotherapy. Nevertheless, there is a history of such attempts. For example one of the current authors (Ward, 2008) demonstrated how a connectionist model could be used to capture significant aspects of the experience of a hypothetical client, using client centred principles to drive the assumptions behind the model. Interestingly, it was evident that the resulting model could also be seen as capturing explanations and concepts more typical of psychodynamic theories (in that a therapist who elicited some of the original childhood experience encoded in the self structure might inhibit the clients fluidity and flexibility in examining these structures). Thus neuroscience level accounts of phenomena within psychotherapy may be able to demonstrate underlying commonalities across different traditional theoretical approaches.

More recently Tryon (2014) has written a thorough and comprehensive text in which he considers a whole range of properties inherent within artificial intelligence inspired representational systems. He goes on to consider at length the implications of these observations for psychotherapy. For example, he suggests that such models demonstrate how a large amount of sophisticated and complex processing within a cognitive architecture can take place at an implicit level. Thus such models are consistent with the notion that significant amounts of human information processing takes place at an unconscious level. Furthermore, one of the intriguing properties of such networks is their power to generalise. Where such models have been trained on a rich set of real world data, they are then able to generalise to a new set of data even if there are large gaps compared to the original training. This property is readily applicable to human behaviour. For example a client may experience powerful transference when working with a therapist who only very partially recreates their past experience with a significant other. In a similar manner, clients may generalise a past trauma to a new situation which only partially replicates the original experience. This could be important in understanding some of the experience of clients that have continuing difficulties following a major traumatic event.

As discussed above, artificial neural network models can give us some insight into how events and emotions impact on the brain and can then continue to influence us in the future. Such information is retained in the brain in many different forms, from specific, retrievable episodic memories, through to more abstract semantic knowledge, as well as attitudes and values (Eysenck and Keane, 2000). One of the richest aspects of our representations is in relation to ourselves. We can recall many important events in our lives, we have some notion of what we think about particular issues, and we are aware of how we are currently feeling and what our immediate and future goals are. This aspect of our representational system is sometimes referred to as “self” (Conway and Pleydell-Pearce, 2000).

In a recent book, one of us (Plagnol, 2004) has demonstrated how cognitive notions of representation from neuroscience can be used to explain how each human constructs a complex internal world, which he termed “representational space”. This can be further combined with traditional notions of defence mechanisms, such as denial or repression, to suggest how this internal representational space can be constrained over time. Such constraints on representational processes then give rise to the various psychological issues which clients bring to us as part of therapy. For example, many clients with depression can appear to make good progress, but reach a plateau, from which further progress may depend upon unearthing other long standing issues which remain unresolved. These may have become lost to awareness from the weight of further events and experience (Plagnol and Mirabel-Sarron, 2006).

As with any theoretical analysis, the value of the neuroscience approach within psychotherapy will depend on its utility in helping us to think further about our work, as well as develop research and generate future predictions and new lines of enquiry. We believe that neuroscience will prove highly fruitful in this regard, and to illustrate this case further we will consider in more detail one client issue we mentioned briefly above, that of trauma.

A consideration of trauma from the neuropsychotherapeutic perspective.

Clients that have experienced a serious and potentially life threatening trauma such as a car accident, assault or incident of war may come to develop a condition known as post-traumatic stress

disorder (PTSD). This condition has come to be characterised, in diagnostic frameworks such as the American Psychiatric Association's Diagnostic and Statistical manual (e.g. see Brewin et al, 2009), as one in which there is a repeated reliving of the original trauma. This frequently takes the form of intrusive flashbacks of the original event. It can lead to avoidance of stimuli which are associated with the original trauma, anxiety symptoms and withdrawal from daily activities. It can lead to a general blunting of feelings, disturbance of attachments to others and disruption to the pursuit of normal activities. Thus the effects can be pervasive across the whole of the individual's mental life. Whilst the original traumatic event itself can lead immediately to a dissociative state, there is always a delay to constitute the full condition which can sometimes be many years.

From a psychological point of view the phenomena of PTSD raises several issues which need to be explained (Plagnol, 2004). To begin with, why is it that the memory of the original event does not weaken with time and become forgotten, as tends to happen to other memories? Secondly, why is there a delay (which is sometimes very long) between the event and the classical symptoms becoming evident? Thirdly, how do the repercussions from what is often a very circumscribed event, come to dominate the whole of the mental life of the person affected? Fourthly, why is the life threatening nature of an event a key characteristic that stirs up a traumatic reaction, despite the universality of death for mortal beings? Given this universality of death, why does such an event seem to produce a traumatic reaction in some whilst others appear to be resistant?

Previous theoretical accounts can account for these paradoxical features to some extent, but not in a comprehensive and convincing manner. For example Janoff Bulman (2010) and Horowitz (1990 and 1997) suggest that the traumatic event may contradict the person's fundamental beliefs about the world and themselves. Conflictual aspects of the event are not integrated fully into the person's main memory system, leading to activations as intrusions or flashbacks. This approach can explain some aspects of the syndrome but not others. For example it doesn't explain why some people are vulnerable whilst others are not, and it doesn't explain why the traumatic event contradicts the fundamental beliefs, because there is no representational model of "fundamental beliefs" in this approach (and more generally no detailed model of the inner world).

Foa et al (1989) proposed the notion of a fear structure created in memory which encodes aspects of the event, the person, their reaction and the relation between these. This model can explain why some memories become traumatic after a period of time, when the danger they represent has become more apparent. However it does not explain why some events, but not others, have the potential to become traumatic, i.e. to have led to the creation of a fear structure. This account also does not straightforwardly explain why this is more likely for some people compared to others.

The psychodynamic perspective has emphasised how defence mechanisms might lead to the non-elaboration of the traumatic event in memory, in particular due to the notion of impending death being especially troubling to comprehend and take on board (Freud, 2003). Such ideas appear to be able to account to some extent for some of the enigmas of traumatic experience, i.e. why some events are likely to be traumatic. However, the notion of some events being "extra-ordinary" seems to rest on a notion that the issue of "death" is disturbing, and difficult to represent within our world views and self-schemas — so why is it something that is so difficult to represent within our world can have such pervasive effects on this world?

More recent accounts (Brewin et al, 1996, Brewin, 2001) have suggested that there is a dual representation system in memory. One system involves conscious and highly elaborated memories, which can be retrieved actively. A second system is linked to extreme fear reactions involving the Amygdala (Cozolino, 2010). These memories are formed very fast, and do not involve extensive, conscious elaboration. These memories are much closer in nature to the actual lived experience of the moment, including relevant sensations and emotions. The suggestion is that these memories can be automatically triggered by associated stimuli, which will result in the phenomenon of "flashbacks". This theory is attractive in terms of accounting for the important phenomenon of flashbacks, but again it does not account for why particular events evoke trauma syndromes in some people and not others, and it also raises additional questions around elaborated versus non elaborated memory.

There have therefore been a number of suggestions in the literature about how trauma syndromes come about, and how the condition unfolds. Together they seem to suggest that there is something about traumatic events which creates particular structures or representations in the brain. The nature of such events is often such as to represent an existential wrench for the individual in terms of their prior expectations and experience. In particular, they often involve near death experiences and in many cases the actual death of other people involved. Even where death is not at issue, the client may have felt a severe and significant existential threat, e.g. to their way of life, relationships, etc. Discrete traumatic events may provoke severe levels of anxiety and fear, resulting in the amygdala being prominent in the processing of the event, whilst more elaborate processing in memory involving conscious reflection and verbal elaboration may be diminished or absent.

We would argue that a fuller understanding of the experience of trauma can be realised through the integration of the above ideas, with the notion of representational space (Plagnol, 2004). Such an extended model should enable us to give an account of how mental work on a particular type of mental representation can help to transform a primitive, near sensory, and fear arousing memory of an event into a more elaborated , verbally encoded and emotionally more neutral representation. Such an account should also be able to suggest why some memories of potentially life threatening events are difficult to process and integrate into normal memory structures. It should also be able to suggest how individual life stories and expectations can resonate with a particular event to result in outcomes specific to a particular individual.

According to Plagnol's (2004) representational space view, all representation is based on analogical, near sensory, experience. These experiences are coded and connected by symbols and language, creating a complex inner subjective world. This inner world therefore consists of millions of fragments of representation. It is further proposed that this inner world can be more or less consistent. Divergent fragments which are discrepant to other experiences will raise a degree of tension (see Conway, Singer and Tagini, 2004, for a similar account, and also Grauwe's notion of incongruence discussed above).

The general tendency is to reduce tension across the network, by seeking to integrate discordant experiences. A traumatic event therefore, which is in contradiction with other aspects of the representational system (memories, views about the self etc.), will raise the level of tension within the system. In doing so, it will invoke various defensive processes, e.g. the premature inhibition of the elaboration of trauma related primitive memories. As a consequence, the trauma related

memory remains active in its original, non-elaborated, and fear arousing form. This leads to the experience of "flashbacks", and accounts for the phenomenon of repetition.

It is further suggested that a life threatening event which confronts the individual with a real possibility of death, creates a fundamental tension within the representation system as a whole. Indeed, the possibility of death and no longer existing is fundamentally alien to the ordinary fragments of the representational space, and most areas are therefore brought into conflict with this new experience. Any other representation which happens to be active at the same time as the flashback becomes "infected" with the incongruence, so that slowly, over time, the conflict and feeling of incongruence comes to affect more and more of the representational space. This explains the phenomenon of extension, and delay. The impact on the individual will depend on the nature of the event and its resonance with that person's overall narrative and life story, explaining the phenomenon of selective vulnerability.

Consideration of trauma – specific cases of re-emergence in elderly clients.

To take the discussion of a neuropsychotherapeutic view of trauma further, we will now look at several specific cases. These are examples of working with trauma in the elderly, conducted by Nicolas Delrue under the supervision of Arnaud Plagnol. What is potentially very interesting about these cases is they all demonstrate the re-emergence of a traumatic episode, sometimes many years after the original event. These cases also highlight the increased vulnerability of elderly clients as they enter the new and possibly strange environment of a nursing home. We will refer to the cases simply through the letters A to D.

Mrs A was 91 years old and had been admitted to the nursing home for seven months. It was noted that she ate very little, and was losing weight. It emerged that she could not stand the taste of meat, especially the taste of blood. Her entry into the nursing home appears to have triggered a re-emergence of trauma stemming from the Second World War, when the client experienced exile and hunger. The strong taste of food in the nursing home led to sensory flashbacks and memories of the war. Previously the client had avoided strong tastes and foods. As a consequence, she experienced extreme anxiety and panic attacks during mealtimes.

Mrs B was 92 years old and had been in the nursing home for 10 months. Mrs B seemed to have a problem with strong smells and disinfectant. After further exploration, this seemed to be linked with an earlier hospital admission, which had been traumatic. The various smells appeared to have triggered sensory flashbacks to the unpleasant memory of the earlier hospitalisation. This led Mrs B to avoid particular odours. She suffered anxiety symptoms, and withdrew from everyday activities.

Mrs C was 93 years old and had been in the nursing home for 12 months. She struggled with the commotions of everyday community life. She tended to avoid noise, e.g. other residents if they were shouting, and she became anxious if she was not occupied by something. Further exploration revealed that in her early life she had suffered an anxiety provoking admission to a sanatorium. Stimuli in the nursing home seemed to be re-awakening these earlier, dormant, memories.

Mr D was 91 years old, and had been resident in the nursing home for six months. It was noted that Mr D at first tended to avoid a particular female resident, and then over time this widened to include

other female residents. It became evident that Mr D had lost his wife prior to being admitted, and that he had found this distressing and traumatic. This led him to experience high anxiety and panic attacks when out and about in the home, which in turn tended to mean that he spent much of his time isolated in his room.

In each of these four cases we can see that on being admitted to a nursing home, some aspect of the environment triggered an earlier traumatic sensory memory, leading to a re-experiencing of the trauma, in some cases many years later.

The residents were all offered cognitive behaviour therapy, adapted for elderly clients. This was accompanied by relaxation, plus focussing on relevant sensory cues, and encouragement to talk about the traumatic event. In each case this led to a disappearance of the sensory disturbance and the trauma related symptoms.

How do we make sense of this sequence of cases, in the light of the argument we are putting forward around a neuroscientific view of trauma? In the first place, we can see that each case demonstrates how environmental stimuli can trigger a traumatic memory. In the case of Mrs A, these memories seem to date back many years to the Second World War, which illustrates the point very forcefully that traumatic memories remain vivid and do not necessarily fade over time. In each case, the client seems to have coped by avoiding relevant triggers which concords with Grauwe's (2007) point that clients' strategies tend to either be driven by approach or avoidance. Mrs A avoids certain foods, Mrs B does not have to contend at home with disinfectant smells, Mrs C avoids busy social environments with an institutional feel, and Mr C stayed at home and did not have to mix with females. In the residential home environment, each client has to contend with the trigger stimuli they had previously been able to avoid, leading to reactivation of dormant trauma memories. In the case of Mrs A and Mrs C this is after some considerable period of time.

In the nursing home environment, the residents were then offered cognitive behaviour therapy for trauma. They were encouraged to talk about the original trauma, plus the current stimuli provoking the reaction. They were thus able to process the original memories, creating time bound, elaborate and verbally enriched representations, linked to an awareness of the trigger stimuli. At the same time they were trained in relaxation, which helped them manage the trauma and anxiety and face the triggering stimuli. In each case, there was a reduction in the sensory disturbances and the trauma related symptoms. Thus the clients were able to elaborate the sensory trauma related memories. We would argue they were then able to finally integrate this experience into their representational space, in such a way that did not lead to increased tension across the representational system. These cases are also reassuring in suggesting that it is never too late to work with trauma. It also highlights the point that practitioners that work with elderly clients should be aware of the possible re-surfacing of earlier traumas prompted by exposure to new environments and cues. The cases described here add further weight to the conclusions based on other recently published accounts describing the link between pain and trauma memories in the elderly (Delrue and Plagnol, 2016).

Potential benefits of a neuropsychotherapeutic approach.

For a new approach to therapeutic work to be worthwhile, we would argue that it should produce benefits across several areas. First of all it should help us to understand better the processes underlying the key issues which our clients have to contend with. It should provide useful insights which can improve clinical work, and these should produce potential benefits for clients. Finally, it should lead on to the generation of new ideas for research, and the formulation of new predictions and hypotheses which can be tested.

In relation to trauma, we would suggest that the representational approach we have outlined complements existing ideas in the literature. It can lead to fuller understanding of this common client issue. In response to an event which provokes extreme levels of threat, the resulting brain processes are dominated by fear, mediated via the amygdala. Memories of the event are strongly linked to sensation and imagery and lack the usual deep episodic processing and associations to the wider representational system. The nature of many traumatic events is such that they will frequently represent a fundamental challenge to the client's previous world view. As such these traumatic memories will evoke anxiety, and clients will avoid re-experiencing them and carrying out further processing on them. The nature of client inner world which might predispose them to struggle with the processing of difficult traumatic memories is something which future research could explore. Neuropsychotherapy offers some rich tools like representational spaces to develop detailed models of the inner world — such models are still surprisingly scarce despite the near seventy-years old intuition of Carl Rogers (1951) relative to the importance of meeting the client's inner and singular world.

Such work might usefully link to previous literature on resilience. For example, we might predict that where clients have experienced a highly protective environment and not previously had to deal with the negative aspects and grim realities of life — a too "bright inner world" —, this might be a risk factor, paradoxically as much as for clients that have experienced a highly negative environment and previously had to deal strongly with the grim realities of life — a too "dark inner world". However such predictions are very general and it is at the heart of the notion of resilience that a general prediction of risk can be falsified by an individual life story. The true advance therefore would be to account for the vulnerability of a *singular* individual with his/her unique subjective life story: this vulnerability depends on his/her specific inner world as to how it has been shaped by the adverse events encountered in the past and their more or less unified integration within his/her "representational space".

In dealing with the tendency of clients to re-experience the trauma, the representational approach would suggest that a useful focus would be on the sensory aspects of the event, and the environmental aspects which trigger the memories. Helping clients to become aware of these associations and to reprocess them will enable them to decrease the emotional strength of the trigger and integrate the memory of the trauma into the wider representational system. It may be possible in further research to look at the nature of a client's cognitive representations, and to

specify the amount and type of restructuring required in order to recreate a complete narrative which does not arouse internal tension.

The representational approach may also help us to understand and further develop other ways of dealing with trauma. For example, exposure, hypnosis and eye movement de-sensitization and reprocessing (EMDR) have all been found to meet with a measure of success. It may be that each of these allows people to begin to access the painful memories and start the process of integrating them into the wider representational system. It may also allow us to understand a number of other related issues. For example why are some people resistant to therapeutic approaches? What is it that characterises clients who appear to show a pattern of "false recovery", where the repetition pattern appears to have stopped but the negative consequences of the trauma are still apparent ? Can we detect trauma with more precision if we add in the representational perspective? For example will it make us more aware when clients present with a pattern dominated by somatosensory or substance use issues?

As we have already noted in the description given above, of elderly clients entering a nursing home environment, traumatic reactions can still be evident many years after the original event. The representational view would suggest that clients can learn to live with traumatic episodes by avoiding the key triggers in their environments. If at a later date they are then unable to avoid these triggers, the original trauma may re-emerge. This same pattern was evident in a piece of work recently carried out by the first author with a younger client. This client had experienced a very traumatic break up with their partner some years previously. They had found this very difficult at the time, but after several years had found a way of carrying on. The original trauma however was reawakened some years later when, as part of a newly developing relationship, some of the original pattern in the earlier trauma was recreated. Another possibility is that where clients reprocess triggers in a particular and specific way, the original trauma could re-present at a later date when the client is exposed to a slightly different version of the trigger than that which was originally worked upon. This is another avenue for further exploration in future research.

In more general terms, neuropsychotherapy might help psychology practitioners make links between common ideas across the many approaches which are now being put forward. For example Mentalisation (Fonagy, Gergely and Jurist, 2004) and dialectical behaviour therapies (Robins and Chapman, 2004) both touch on how over time people build up inner representations and behaviour patterns. Compassion focussed therapy (Gilbert, 2009) talks about hindering environments, and schema therapy (Young, Klosko and Weishaar, 2003) talks at length about maladaptive behavioural patterns which are triggered by particular circumstances. Neuroscience can provide the generic language which will allow counselling psychologists to unite all these ideas into a single framework to guide future research and practice.

Conclusion.

In this article we have presented the Neuropsychotherapeutic Approach as a novel way of bringing together ideas from the realm of neuroscience and using these to help us to understand and further our work with clients in psychotherapy. We have suggested that there are many strands which make up this approach, from Grawe's comprehensive review and proposed model of therapy,

through to our own suggestion of using representational theory to understand the complex inner world of our clients. We then went on to illustrate our argument by referring to one particular client issue which most therapists experience in their work with clients at least to some degree. This is the issue of trauma. We described how there are a number of theoretical explanations of the phenomena of trauma in the literature. There are also a number of paradoxes, which these current approaches do not always seem to explain satisfactorily. We described how a view which takes in the representational approach could explain such paradoxes, for example why some people will experience trauma from a particular event whereas others will not. We illustrated our points further through reference to some recent research conducted by the second and third authors. This shows how trauma can re-emerge in elderly clients entering a residential setting, even many years after the original event. The difficulties of all four clients were resolved after giving them the opportunity to reprocess their memories, thus integrating them into the representational space. Finally we went on to discuss how such an approach can be fruitful in the further development of research in psychotherapy. We believe that such an approach is likely to be productive not only in relation to trauma, but also for many of the other issues which our clients face. Given that neuroscience is arguably one of the current leading paradigms in psychology (see for Eysenck and Keane, 2000), such an approach may prove attractive to many counselling psychologists.

Neuropsychotherapy as an integrative framework.

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Figure 1. The consistency theoretical model of mental functioning.