

## NEUROSCIENCE AND PSYCHOTHERAPY

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### ABSTRACT

*Neuroscience presents great challenges and opportunities for psychotherapy. This article proposes recommendations and avenues for practice. Neurological knowledge is being employed in psychotherapy in three broad ways. First, it is used to explain and justify existing practices in psychotherapy, (e.g., the neuropsychanalysis of Mark Solms). Second, neural localization studies are used to devise novel treatments for therapy-resistant conditions (e.g., Jeffrey M. Schwartz's work on obsessive-compulsive disorder). Third, the fact of neuroplasticity is used for both psychoeducation and as an overarching principle guiding therapy (e.g., the neuropsychotherapy of Klaus Grawe).*

Today everyone is aware of the stupendous growth in knowledge of the brain enabled by technological and scientific developments. In psychotherapy, not surprisingly, there are several efforts to develop theory and practice alongside these advances. In this paper I consider three such developments in psychotherapy: neuropsychanalysis, neurolocalisation, neuroplasticity.

#### NEUROPSYCHOANALYSIS

A new field of study, neuropsychanalysis, has developed alongside modern neurology. It is devoted to the task that Freud—himself a neurologist by training—foresaw: “we shall have to find a point of contact with biology” (Freud, 1915, p. 175).

The neurologist and psychoanalyst Mark Solms has been at the forefront of this movement. For instance, he has studied the dreaming brain—dreams being Freud’s royal road to the unconscious—and found that “aspects of Freud’s account of the dreaming mind are so consistent with the currently available neuroscientific data that I personally think we would be well advised to use Freud’s model as a guide for the next phase of our neuroscientific investigations” (2001, p. 88). Several other studies have been conducted. For instance, Colace (2004) has studied the motivational bases of dreaming—proposed by Freud—in heroin addicts. The dreams of addicts in remission are filled with images of using or seeking heroin, while those of addicts who are not in remission are not. And Tarnow (2003) proposes that dreams and long-term memory structure may be closely related in what he calls “long-term memory storage”.

Another area that has excited psychotherapists is that of mirror neurons which are taken as evidence of the neurological presence of cells that enable empathy and facilitate communication (e.g., Wolf et al., 2001). Aragno (2008) says that this discovery collaborates what psychoanalysis has maintained.

However, Vivona (2009) has provided a critique of way mirror neurons have been used to explain and substantiate countertransference. And Solms, concerned that the enthusiasm for neurology reduces the mind to the brain, insists that, “Even in cases where an organic aetiology is indisputable....the mental

symptoms themselves can only be understood psychologically” (1995> P. 107)- He recommends “a fully *psychoanalytic* investigation of patients with focal neurological lesions” (2000, p. 104).

Recommendation for practice: If psychoanalysis sets itself the task of building bridges with neurology, this must be done in a scientific spirit. This includes a willingness to reject fondly held notions should they prove to be false. Also, it means refraining from cherry-picking findings from neurology to justify current practices. That said, approached properly, it may be that psychoanalysis has much to benefit from neurology and may in turn contribute to neurology ideas based on a century of clinical experience.

#### NEUROLOCALISATION

Neuro-imaging studies have progressed to detailed knowledge of specific areas of the brain and their functions. This knowledge has already lead to specific psychological treatments, for example, obsessive-compulsive disorder, a condition notoriously resistant to treatment. An ‘OCD circuit’ has been found which links the caudate nucleus, anterior cingulated gyrus, and orbital frontal cortex dysfunctionally. The warning system—*something’s wrong!*—is over-active and the reassurance mechanism—*it’s OK, the problem’s been dealt with*—is ineffective. Thus the patient’s overwhelming dread and the ineffective repetitious behaviours.

The psychiatrist Jeffrey M. Schwartz has used this knowledge to devise a highly effective therapy that, in essence, educates patients to behaviourally ignore their impulses, and to bear the accompanying anxiety. Within fifteen minutes the anxiety dissipates and the neural circuit, by not being activated becomes smaller and less efficient (see Schwartz & Beyette, 1997;Schwartz & Begley, 2002).

Another instance of neurolocalisation is the fact that the hippocampus shrinks the longer a person is depressed, leading, for example to fewer childhood memories (Vythilingham, et al, 2002). This knowledge should guide the therapist as to what kinds of therapeutic work the client is actually capable of.

Recommendation for practice: As the philosopher Noe (2010) reminds us, the mind is not synonymous with the brain. Every day newspaper articles tout studies, which have ‘located’ aspects of human consciousness. We can expect many further developments where treatment follows neurology, but this is not a simple matter rejigging neurons.

#### NEUROPLASTICITY

While neurolocalisation is basic to neurology, it has been known at least as far back as the work of Luria in World War II, that if certain parts of the brain are destroyed other areas can adapt to accomplish the functions normally associated with the former structures. This is cortical remapping. The brain, in short, is not a fixed structure, but a plastic one. Repeated and persistent firing of neurons causes neuronal growth and increased efficiency. *Neurons that fire together wire together*, it is commonly said. This is Hebbian Theory or Hebbian Learning, named for the psychologist Donald O. Hebb.

Translated to the world of psychotherapy, this means, according to the psychologist Klaus Grawe, that psychotherapy is concerned with neural change. Indeed, psychotherapy — and psychotherapists should grasp this fact — is only possible because of neuroplasticity. This has deep implications for psychotherapy. “A therapy session,” he says, “with the attitude, ‘Let’s see what the patient brings up today and take it from there,’ is really a wasted hour in terms of the likelihood that new neural activation

patterns will be permanently ingrained” (2007, p. 42). In other words, neuroplasticity should be at the foreground of the therapist’s thinking.

Recommendations for practice: Two implications immediately suggest themselves. First, when it comes to psychoeducation, what might be called the *neurological interpretation* proves to be very helpful and easily ‘digestible’ for patients. Clinical experience shows that many clients do not take neurological explanations personally, and therefore do not react defensively.

Second, knowledge of the structures of the brain and neuroplasticity leads to insight about the ordering of psychological approaches. In depressed individuals the left prefrontal cortex is underactive; this corresponds with paucity of positive feelings and low level of goal-oriented behaviour (Garavan & Stein, 1999). So, because of the way it functions, the depressed brain cannot do depth psychotherapy well it can cope with Behavioural Therapy though. Once the crisis is past psychodynamic work is both doable and necessary in order to lower the chances of relapse.

#### QUESTIONS RAISED BY THE PAPER

What is primary neurology or psychology? While it is crucial to avoid reducing the mind to the brain, I find myself in agreement with Yovell: “Psychoanalytic theory can and should go beyond our current neurobiological understanding of the mind, but it must never contradict it. Therefore, psychoanalytic theory should be continuously re-examined and revised, to ensure its coherence with emerging neurobiological research findings” (2002,171).

Do psychotherapists need to know about neurology? My view is that, whether they know it or not, therapists are “applied neuroscientists”. It is incumbent on us to devise individual

courses of treatment aimed at enhancing neurological-function and mental health (Cozolino, 2010).

#### PROGRESSING THE TOPIC

I am currently involved with a graduate student, Ruth Bradley, in studying the neurology of repetition—what Freud called ‘working through’ (1914); how and how often must something be repeated in order for a new neural sequence to become effective?

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