

NWRPA Newsletter April 2022

15 years of neuroscientific research into appetite control: from restrictive eating to addiction

Dr Samantha Brooks

Friday 8 April 2022

Summary by Frank Kelley

Samantha is a member of the NWRPA. In her professional life she is a Reader of Cognitive Neuroscience at Liverpool John Moores University, a Chartered Member of the British Psychological Society and a member of the Neuro-Psychoanalytic Society. She is developing an intervention in Liverpool – Curb Your Addiction (C-Ya).

In her Zoom talk Samantha provided an overview of her research over the past 15 years at a number of medical campuses including the The Maudsley Hospital, King's College London, and the Faculty of Health, Liverpool John Moores University.

As you may know Samantha has an interest in how psychoanalytic ideas may compliment a neuroscientific understanding of eating disorders. She particularly mentioned Sigmund Freud's topographical model of conscious, preconscious and unconscious.

Her work with researchers at Uppsala University in Sweden shows there are neurological markers of risk for anorexia. There are also links between the risk of anorexia and the COVID lockdown.

She considered the neural processes of appetite and impulse control as well as the unconscious functions associated with anorexia and bulimia. She is interested in what we do when we are pondering. This involves complex cognitions which are not entirely conscious. We can easily and mistakenly think of these as top down processes of cognitive functioning.

When we dabble in rewarding substances we switch into our brain areas of impulsivity. With bulimia there is anxiety but only after a binge when we realised what we have done. For anorexia we switch into brain areas of compulsivity with associated belief systems and ruminations.

Subliminal emotions interact with working memory. Working memory is our ability to hold in mind complex cognitions, to follow strategies for tasks while avoiding distractions. In a healthy population people will fend off subliminal images and keep to task.

Anorexics are actually good at working memory. They keep thin and are not distracted by food. Experiments have shown that in anorexia subliminal images of food lead to increased cognitive controls. Subliminal aversive or neutral images did not significantly disturb working memory performance.

Anorexic brain lesions are in an area of the brain usually associated with ageing. Higher BMI anorexics had developed this brain area and there was no age related decline.

Functional studies of brain activity, rather than studies of brain structure, show more activity than expected in certain areas of the brain; the caudate nucleus, the superior temporal gyrus

and the insular cortex. However this activity is related to restricting eating and not seen in bulimia.

Ruminating on appetite means that these areas of the brain do not work well enough for non-food tasks. Response times for working memory tasks are slower than for people of normal weight. Adolescents do not typically have a full eating disorder but do have obsessional signs. This is related to the prefrontal area of the brain not maturing until the mid-twenties..

Male methamphetamine users in rehab in South Africa were given tasks and training which helped with developing working memory. This training led to an increase in brain volume and plasticity. Their self regulation improved and they were more able to participate in group therapy. This suggests they had more control over subliminal anxiety.

This is how Samantha came to join the NWRPA. It is the importance of subliminal emotions and their interaction with working memory which led to her interest in psychoanalysis. Her interest was returned. **We thank Dr Samantha Brooks** for meeting our interest in neuroscience with great warmth, enthusiasm and expertise.