

medial orbitofrontal cortex to dorsal thalamus, amygdala and habenula nucleus. amSTN DBS improved cognitive flexibility, whereas VC/VS DBS did not, and affected a circuit connecting the amSTN with lateral orbitofrontal cortex, dorsolateral prefrontal cortex and dorsal anterior cingulate cortex. Both circuits have different functions and are known to be abnormal in OCD. The implications of these findings for the future management of severe OCD will be discussed.

\*A Randomised Trial Directly Comparing Ventral Capsule and Anteromedial Subthalamic Nucleus Stimulation in Obsessive Compulsive Disorder: Clinical and Imaging Evidence for Dissociable Effects. Himanshu Tyagi, Annemieke M. Apergis-Schoute, Harith Akram, Tom Foltynie, Patricia Limousin, Lynne M. Drummond, Naomi A. Fineberg, Keith Matthews, Marjan Jahanshahi, Trevor W. Robbins, Barbara J. Sahakian, Ludvic Zrinzo, Marwan Hariz, and Eileen M. Joyce, *Biological Psychiatry*, in press.

## 6 MENTAL IMAGERY AND MENTAL HEALTH SCIENCE: FROM LAB TO HOSPITAL TO A REFUGEE CAMP?

Emily A Holmes. *Uppsala University, Sweden*

10.1136/jnnp-2019-BNPA.6

**Emily Holmes**, PhD, DCLinPsych is a Professor in Psychology at the Department of Psychology, Uppsala University, Sweden. She is also affiliated to the Karolinska Institutet's Department of Clinical Neuroscience, and is a Visiting Professor of Clinical Psychology at the Department of Psychiatry, University of Oxford, UK. Holmes received her degree in Experimental Psychology at the University of Oxford, UK. She is also a clinician and completed a clinical psychology training doctorate at Royal Holloway University of London, and a PhD in Cognitive Neuroscience in Cambridge, UK. Holmes' work as a clinical psychologist has fuelled her research questions. She is interested in psychological treatment innovation in mental health – both in creating new techniques and reaching more people. Under the wider umbrella of mental health science, her approach brings together psychology, neuroscience, psychiatry, maths and more. Holmes' research has demonstrated that mental imagery has a more powerful impact on emotion than its verbal counterpart. Her group is particularly interested in understanding and reducing intrusive memories after trauma. This is relevant for people after a traumatic event, whether a severe motor vehicle accident, traumatic childbirth or war. She is an Associate Editor for Behaviour Research and Therapy. She is on the Board of Trustees of the research charity 'MQ; transforming mental health'.

Traumatic events can affect anyone from a road traffic accident, to traumatic childbirth or war-related trauma for refugees. A core clinical symptom for many people who experience trauma comprises intrusive memories to the event. Intrusive memories that 'flash backwards' to past trauma occur in post-traumatic stress disorder (PTSD). They take the form of mental imagery, that is, an experience like perception in the absence of a percept, such as 'seeing in our mind's eye'. Indeed, intrusive, affect-laden mental images can cause distress across mental disorders. Mental images allow us to time travel, and can also 'flash forwards' to the future such as those can occur related to suicide or in bipolar disorder.

My clinical research group has an interest in understanding and treating maladaptive mental imagery via psychological

therapies. To do this, we are curious about what we can learn from cognitive psychology and neuroscience to inform novel treatment development. I will discuss recent work concerning intrusive memory encoding, and a mechanistically informed intervention aiming to disrupt memory re-consolidation via dual task interference, thereby to reduce the frequency of intrusive memories. Recent work on tackling mood instability via focused imagery techniques will be discussed. A broader vision for science-informed psychological treatment innovation will also be explored from working hospitals (Iyadurai et al, 2018, *Molecular Psychiatry*) to further afield with refugees (Holmes, Ghaderi et al, 2018, *Lancet Psychiatry*).

## 7 HOW NEUROSCIENCE CAN INFORM PUBLIC POLICY

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10.1136/jnnp-2019-BNPA.7

**Facundo Manes** is an Argentinian neuroscientist. He was born in 1969, and spent his childhood and adolescence in Salto, Buenos Aires Province. He studied at the Faculty of Medicine, University of Buenos Aires, where he graduated in 1992, and then at the University of Cambridge, England (Master in Sciences). After completing his postgraduate training abroad (USA and England) he returned to the country with the firm commitment to develop local resources to improve clinical standards and research in cognitive neuroscience and neuropsychiatry. He created and currently directs INECO (Institute of Cognitive Neurology) and the Institute of Neurosciences, Favaloro Foundation in Buenos Aires City. Both institutions are world leaders in original scientific publications in cognitive neuroscience. He is also President of the World Federation of Neurology Research Group on Aphasia and Cognitive Disorders (RGACD) and of the Latin American Division of the Society for Social Neuroscience. Facundo Manes has taught at the University of Buenos Aires and the Universidad Católica Argentina. He is currently Professor of Neurology and Cognitive Neuroscience, Faculty of Medicine and Psychology of the Favaloro University and was appointed Professor of Experimental Psychology at the University of South Carolina, USA. He has published over 100 scientific papers in the most prestigious original specialised international journals such as *Brain* and *Nature Neuroscience*. He has also given lectures at several international scientific fora as the 'Royal Society of Medicine' (London) and the 'New York Academy of Sciences', among others. His current area of research is the neurobiology of mental processes. He believes in the importance of scientific disclosure for Society. He led the program 'The Brain Enigmas' on Argentina TV and wrote many scientific articles in the national press. Finally, Prof. Facundo Manes is convinced that the wealth of a country is measured by the value of human capital, education, science and technology, and that there is the basis for social development.

In the last two decades, mainly in the developed world, we have seen a remarkable shift in how policies are made. Until the late 1990's, the ranks of lead policymakers comprised of economists, lawyers, and financial experts. Behavioral scientists are now increasingly being asked to bring their insights and expertise from the laboratory into the 'real' world. As a result, many experts in behavioral sciences are playing a much

greater role in policymaking across a range of sectors. We have seen the positive results of applying this scientific knowledge in diverse areas of public policy such as taxation, energy, and education, among others. The insights used to design these interventions were evidence-based cognitive and psychosocial discoveries such as the existence of cognitive biases and the importance of social norms in human behavior.

Behavioral units needed to show significant results for a minimum or zero cost in order to prove their worth and thus, cement the incorporation of behavioral sciences into the public sphere. It is time to move on to a renewed level of complexity by designing more comprehensive interventions with deeper implications and long-term results.

The role of neurosciences has been much less explored but shows a promising potential to improve public policy, especially social policy. For instance, the design of anti-poverty programs based on scientific evidence about brain health would be extremely useful to improve the mental capital of persons living in poverty. Findings in neurosciences along the life cycle can be incorporated into the public policy sphere. Understanding the neuroscientific evidence on how to stimulate cognitive and socio-emotional skills among different types of populations is crucial to improve the design of policies and has relevant implications for the mental capital of nations.

Neurosciences can also facilitate the comprehension of those cognitive skills needed for the jobs of the future such as creativity, emotional intelligence, empathy, resilience, cognitive flexibility, and executive functions, among others. Public policy interventions can focus on promoting these skills, which are not fixed and which can be improved and enhanced. Other areas in which evidence from neurosciences can be utilized are: infant development, the adolescent brain, addictions (i.e., opioid epidemic, science and policy of marijuana), neuroeducation or the neuroscientific basis in teaching and learning (i.e., dyslexia), neurolaw (i.e. criminal responsibility, deception, juvenile justice, judges' decision making, witness testimony), prejudice and empathy, violence and aggression, loneliness, normal aging, the future of mind-tech cyborgs, and the burden of brain disorders.

Behavioral insights are gaining popularity in developed countries. However, is this enough to create positive structural changes in the economy and in social welfare? While it is fair to say that nudges successfully allowed behavioral science to enter the world of policy we still have much work to do to reach social and health long-term improvements. In this regard, advances in neurosciences over the last years could help reshape the way we think about important policies and could be useful in helping individuals develop their maximum potential.

## 8 CULTURE ETHNIC MINORITIES AND HEALTH

CBE Dinesh Bhugra. *Emeritus Professor of Mental Health and Cultural Diversity at the Institute of Psychiatry, Psychology and Neuroscience at King's College London*

10.1136/jnnp-2019-BNPA.8

**Professor Dinesh Bhugra** was President of the World Psychiatric Association from 2014–2017 and in 2018 became President of the British Medical Association. Dinesh Bhugra's research interests are in cultural psychiatry, sexual dysfunction and service development. He is the recipient of over 10 honorary degrees. He has authored/co-authored over 400 scientific

papers and 30 books, and is the Editor of three journals (*International Journal of Social Psychiatry*, *International Review of Psychiatry* and *International Journal of Culture and Mental Health*). Previously he was the Dean (2003–2008) and then President (2008–2011) of the Royal College of Psychiatrists in the UK, where he led on major policy initiatives on psychiatry's contract with society and the role of the psychiatrist.

Culture form us and we form culture. Culture influences the way we think and the way we see the world. Furthermore, recognition and presentation of distress as well as patterns of help seeking are very strongly influenced by cultures and our world views. The accessibility and availability of healthcare system also influences when and where we seek help from. Cultures include religion, spirituality, language, diet, dress etc. In many cultures there are no words to express many psychiatric and neurological disorders even though symptoms of distress are easily recognised. In addition, depending upon the explanatory models of distress patients and their families may seek help from non-professional sources. Studies from the USA have suggested that a vast majority of people seek help from personal, folk or social sectors and only a minority reach the professional health sector. This may reflect the American healthcare system. Gender and other factors such as education, social class, housing, employment and economic factors contribute to help-seeking. Cultural identity and embedded within are micro-identities which help formulate a unique cultural framework which differentiates one group from another and can work at both individual and group levels. Using various models this lecture will explore varying presentations and using examples from around the world will illustrate cultural impact on various neurological and psychiatric disorders. Community support in various forms can enable quick recovery and help support vulnerable groups.

## 9 POVERTY AND BRAIN DEVELOPMENT: FROM SCIENCE TO POLICY

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10.1136/jnnp-2019-BNPA.9

**Martha Farah** was born in New York City and educated at MIT and Harvard. She has taught at Carnegie-Mellon University and the University of Pennsylvania, where she is currently the Walter H. Annenberg Professor of Natural Sciences. In 1999 she founded Penn's Center for Cognitive Neuroscience and ten years later she founded the Center for Neuroscience and Society, which she still directs. Martha's work on the ethical, legal and social impact of neuroscience (aka neuroethics) has focused on cognitive enhancement by normal individuals, including the question of whether drugs and devices believed to enhance normal cognition actually do so, and on nonclinical uses of brain imaging. Her other main interest is in the effects of early socioeconomic deprivation on brain development. She studies the latter using behavioral, neuroendocrine and neuroimaging methods. Martha is a Fellow of the American Academy of Arts and Sciences, a former Guggenheim Fellow and recipient of honors including the National Academy of Science's Troland Research Award and the Association for Psychological Science's lifetime achievement award.