Blackwell Munksgaard 2006: 18: 236–239
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ACTA NEUROPSYCHIATRICA

ABTRACTS FROM 'BRAINWAVES' — THE AUSTRALASIAN SOCIETY FOR PSYCHIATRIC RESEARCH ANNUAL MEETING 2006, 6–8 DECEMBER, SYDNEY, AUSTRALIA

Keynote addresses

The neuroscience of consciousness

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Despite the attempts of physicists and mathematicians to model consciousness in artificial systems, there is a need to understand consciousness in a way that caters for the diverse range of chemicals operating in the brain; how else might one explain the various mood-modifying and consciousness-changing effects of specific drugs? We also need to account for disorders such as depression and schizophrenia, and explain how they could arise from the neurochemical context of the holistic brain. In this talk, we shall develop a way of describing consciousness, which on the one hand caters for different momentary states of the physical brain, while at the same time respects the subjective phenomenology that is all too often ignored by scientists. We shall explore a list of properties that would be required of the physical brain, to cater for the subjectivity of consciousness. It might then be possible to test this 'Rosetta Stone' model, in various scenarios of everyday life, and see how such scenarios might be interpreted in terms of functioning of the physical brain.

The NSW Tissue Resource Centre (brain bank) and donor programs: their development and importance for neuropsychiatric research

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Since the 1980s, brain 'archiving' or 'banking' has undergone the greatest social, technological and organizational change in its 200-year history. The NSW Tissue Resource Centre (TRC) was established in 1994 at the Department of Pathology, University of Sydney. The aim of the TRC and linked Australian Brain Donor Programs (ABDP) is to provide human brain tissue for scientific research. The TRC focuses on schizophrenia and allied disorders, alcoholism and motor neuron disease. For the 'bank' to be effective, the TRC needs a wide cross section of the population – that is people who have brain disorders as well as people without disorders (controls). Human brain tissues can be collected either through Departments of Forensic Medicine (DOFM) or through premortem donor programs. At the DOFM, on the day of postmortem, we invite the next of kin (NOK) of deceased persons to consider brain donation for research. We have documented NOK responses to the question of brain donation and 62% of them say 'yes'. We have also reviewed the reasons behind these decisions, which will be discussed. There are several premortem donor programs wherein people sign up during life and donate after death (www.braindonors.org). In 1997, the Neuroscience Institute of Schizophrenia and Allied Disorders (NISAD) established a brain donor program called 'Gift of Hope' for people with major psychiatric illnesses. There are 378 registered expressions of interest and 143 donors have completed the enrollment and assessment process. In 2002, the TRC established a program called 'Using Our Brains', which targets people without illness (controls). Consented donors have repeat neuropsychological assessments throughout their life with a full health, lifestyle and clinical work up. The comprehensive longitudinal profile that results is extremely useful for researchers using TRC tissues. There are over 2000 registered donors and 331 have had their clinical assessments. Many of our premortem brain donors have completed questionnaires regarding

their motivation to donate and this information will be helpful in preparing future promotional activities for both transplantation and research programs. Their neuropsychological assessments have allowed us to derive preliminary normative Australian data on select populations, including those with schizophrenia and alcohol problems. The ABDP also has separate programs for Alzheimer's disease and movement disorders. All donated brains are processed in a standardized manner – one hemisphere is fixed in formalin, the other is frozen at –80°C. A neuropathologist examines all cases and a psychiatric clinician establishes the neuropsychiatric status of the 'case', which must meet DSM-IV criteria. The status of 'control' cases is reviewed using the same process. A secured research database is used to manage all information in relation to each case. Hence, the TRC can provide fixed and frozen tissues from cases that are well characterized both clinically and pathologically. Researchers must complete a 'tissue request form' that outlines the research proposal and identifies their tissue requirements. They must show the scientific validity of the project and their expertise to work with human brain tissue. A scientific board evaluates each request for scientific merit and feasibility prior to approval. Over the past decade, the TRC has collected 445 cases. Tissues have been used for neuropathological, neuropharmacological, immunohistochemical, gene expression and proteomic analyses. Laser capture can be used for microdissection. Tissues have been sent to 108 researchers (84 national and 24 international) for 260 different projects. In 2004/2005, there were 35 research projects compared with a total of 34 projects in the first 5 years. There have been 94 peer-reviewed publications including 34 on neuropsychiatric disorders and 36 on alcohol use disorders. The most popular current research methodologies used by researchers are genomics (37%) and proteomics (31%), which require frozen brain tissue. This is different to the 1994/1999 period where 85% of tissue requests were for neuropathological studies (fixed tissues). The size of tissue samples required has decreased dramatically from blocks of 5–10 g in the 1990s down to 0.1 g of tissue today. Thus, one brain can be used for many different research projects. This increases the value and potential outcomes from each case. Data from different studies on the same cases can be cross-correlated – a value-added outcome. Human brain tissue from the TRC provides an important resource that will become progressively more useful as new techniques such as proteomics and genomics continue to develop and novel antibodies are developed for the further study of neuropsychiatric diseases.

The long and winding road of schizophrenia research

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Research in schizophrenia is undergoing a far-reaching qualitative change as novel technologies ranging from neuroimaging to functional genomics are now center-stage, tending to dislodge traditional clinical research and, to some extent, epidemiology. By placing the emerging new visions of schizophrenia research in a historical perspective (including a personal account of the World Health Organisation-led research in the 1980s), the author highlights both the pitfalls and promises of current attempts at understanding schizophrenia and argues for a more dynamic two-way interaction between laboratory scientists and clinicians.

Mental health literacy: the inside story of a research program

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Background: Mental health literacy covers knowledge and beliefs about mental disorders that aid the recognition, management or prevention of these disorders. This paper describes how a research program on mental health literacy started and how new directions evolved.
Method: Historical overview.
Results: The talk looks at the evolution of two strands of work. The first involves monitoring mental health literacy at a national level. This work initially showed poor recognition of disorders and beliefs about treatment that diverged greatly from those of mental health professionals. Subsequent work showed major improvements in Australia over quite a short historical period that was partly because of planned intervention. The second strand involves the development of Mental Health First Aid as an intervention to improve mental health literacy. This started as a small-scale local activity but has rapidly spread across Australia and to seven other countries. Finally, the talk examines the future directions that work on mental health literacy might take.
Conclusion: Research in this area has consisted of largely unplanned and serendipitous starts in new directions, which were followed by more stable periods of planned research activity.

https://doi.org/10.1017/S0924270800032506 Published online by Cambridge University Press