



CCRN News

Centre for Clinical Research in Neuropsychiatry

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Atypical hand preference and schizophrenia: coincidental or causative?



The seemingly unique human tendency to use the right hand rather than the left for fine motor function can be observed in about 90% of the human population. The remaining 10% are atypical (i.e. left- or mixed-handed). The gene for handedness is not yet identified.

CCRN's **Dr Milan Dragovic** (left) is currently researching brain lateralisation and hand preference and their relationship to mental disorders. Left- or mixed-handedness has been associated by researchers with schizophrenia, epilepsy and other disorders for decades, yet there is no final

verdict on their true relationship.

In an article currently in press at *Review of Psychology*, Dragovic and UWA School of Psychology researcher Dr Geoff Hammond have reviewed the current state of play in lateralisation research. Atypical lateralisation of hand preference seems to be associated with many structural and functional brain asymmetries, altered cognitive performance, and other clinical features of schizophrenia. Does one cause the other? Or do the two have a common neuro-developmental and genetic origin?

In 1990, researcher Timothy Crow provided evidence supporting the theory that schizophrenia, cerebral asymmetries, language lateralisation, and handedness are linked to each other, and to a single gene. Researchers have also found that left- and mixed-handed patients with schizophrenia have larger ventricular-brain ratios. Atypical handedness (left-handedness in particular) may also be associated with poorer performance on various cognitive measures.

The most consistent associations are found between atypical lateralisation and clinical presentations of illness. Atypical lateralisation is more prevalent in the type of schizophrenia "characterised by impaired cerebral development, poor premorbid adjustment, abnormalities of early motor and cognitive development, and higher prevalence of obstetric adversities", said Dragovic.

The real difficulty, however, is that atypical lateralisation is not specific to schizophrenia. Numerous studies have linked it with diverse conditions, making it unsuitable for genetic linkage and genetic association studies in schizophrenia research.

Dragovic and Hammond suggest that the link between schizophrenia and atypical lateralization is causative. But they also argue that it is one of a combination of factors (genetic, epigenetic and environmental) which trigger an "inexorable cascade of events", resulting in the development of schizophrenia approximately two decades later.

Dragovic M, Hammond G. A joint occurrence of atypical behavioural lateralization and schizophrenia: coincidental or causative? *Review of Psychology*, in press.



Department of Western Australia
Department of Health

CCRN is a specialised research facility of the University of Western Australia's School of Psychiatry and Clinical Neurosciences, funded and operated jointly by the School and the North Metropolitan Area Mental Health Service.

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Seminars and Speakers at CCRN November 2008-February 2009

On 21 November 2008, **Dr Tom McNeil** (Department of Psychiatric Epidemiology, University Hospital, Lund, Sweden) gave a CCRN research seminar on **'Fish's concept of "pandysmaturation" and its physical and mental correlates: investigation in a prospective high-risk study'**.

The most pervasive theory of mental disorder is that brain development may be impeded in early life, and any lesion formed will then interact with the brain's ongoing development. Barbara Fish coined the term 'pan-dysmaturation' in the 1950s to describe a complex series of uneven growth patterns in high-risk children, with both precocious and retarded development identifiable as early as one month of age.

McNeil described the preliminary findings from the Swedish High-Risk Study conducted over some thirty years, following the children of mothers with a mental disorder. McNeil's study involved measuring a wide range of factors from pre-birth to young adulthood, and the preliminary results indicate significant differences in areas such as motor activity, eye contact, and response to stimuli, in children with a genetic risk of schizophrenia. Although less strong than the genetic influence, family stress is another factor, and seems to be most influential in the 6-11 year age range.



On 12 December, **Dorothy Bishop** (Oxford University) gave a presentation to CCRN staff on **'Insight into cerebral lateralisation from the use of functional transcranial Doppler ultrasound'**.

The significance of cerebral lateralisation – more commonly described in terms of being 'left-brained' or 'right-brained' – is not yet fully understood. Is a lateralised brain necessarily a better brain?

Part of the problem is the accurate measurement of cerebral lateralisation, which has thus far been based on behavioural and often-invasive physiological assessments. CCRN is one of the few research centres

evaluating the possibilities of transcranial Doppler ultrasound as a means of exploring cerebral lateralisation.

Bishop reported on several studies in Oxford which have used transcranial Doppler ultrasound to examine the relationship between left-hemisphere speech and language/literacy problems, the development of activities for left- and right-hemisphere activation, and atypical laterality. This technique is cheap, portable, non-invasive, reliable, and is suitable for use with young children.

Do women experience psychosis differently from men?

CCRN operational epidemiologist Dr Vera Morgan (below) recently published findings from the Australian National Study of Low Prevalence (Psychotic) Disorders on the different experiences of men and women living with a mental illness.

Data on differences between men's and women's experience of different types of psychosis can help researchers to understand the basis of these disorders, and it can also inform risk management and treatment.

Morgan and fellow researchers David Castle and Assen Jablensky examined a random selection of just over 1000 cases of psychosis. They compared women's and men's functioning before illness, the onset and course of their psychotic disorder, their symptoms, their levels of disability and their use of health services.

The research found that there were marked differences in how men and women experienced and expressed their illness.

Women reported better functioning before illness, a more benign course of illness, lower levels of disability, and better community integration than men with the same psychotic illnesses.

On the whole, women were less likely to report having hallucinations, delusions or poor concentration, and overall experienced less negative symptoms of psychosis.

Women in the study group were significantly more likely to be in long-term relationships and to have children, and to be engaged in meaningful employment, whether paid or unpaid.

They were also less likely to be on a pension, and reported higher levels of satisfaction with their level of independence and their life as a whole.

Yet when Morgan compared women with different psychotic illnesses, the differences were even more marked.

"In particular, women with schizophrenia were severely disabled compared to other women."

Women with schizophrenia were more likely to be childless, be unemployed, and receiving disability benefits.

"Some people have hypothesized that oestrogens may play a protective role in delaying onset or moderating the course of schizophrenia in women. However, we were not able to investigate this in our data," said Morgan.



V Morgan, D Castle, A Jablensky (2008) Do women express and experience psychosis differently from men? Epidemiological evidence from the Australian National Study of Low Prevalence (Psychotic) Disorders, *Australian and New Zealand Journal of Psychiatry*, 42: 74-82.

WA joins Australian Schizophrenia Research Bank

Schizophrenia research can be held back by the difficulties of recruiting large numbers of people for research into this complex disease. To overcome this limitation, a national coalition of researchers from NSW, Queensland and WA has established the Australian Schizophrenia Research Bank (ASRB).

Institutions involved in ASRB include the Schizophrenia Research Institute (SRI), University of Newcastle, Centre for Mental Health Studies, Medical Genetics Laboratory, Hunter Area Pathology Service (HAPS), Centre for Rural and Remote Health, University of Queensland, Queensland Centre for Mental Health Research, University of Western Australia, and WA's **Centre for Clinical Research in Neuropsychiatry**.

ASRB comprises a large sample of people with schizophrenia and their first-degree relatives, matched with healthy controls (people without the disorder) with linked clinical, cognitive, neuroanatomical and genetic data.



These data will be available to Australian and international teams to support researchers working in the clinical, cognitive, genetic, and brain-imaging fields. The ultimate aim is to improve treatments and develop preventative strategies for this devastating disorder.

The Western Australian component of this national research project is nested in the WA Family Study of Schizophrenia, based at CCRN. Staff involved with ASRB include (clockwise from left) psychiatrist and CCRN director **Professor Assen Jablensky**, psychologists **Dr Jo Badcock** and **Ms Lisa Dawson**, and WAIMR geneticist **Professor Luba Kalaydjieva**.



If you are interested in volunteering for ASRB as a person with schizophrenia or as a healthy control, please read the information at:

http://www.health.wa.gov.au/ccrn/docs/CCRN_ASRB_info.pdf

News and Notes

Staff changes: In December 2008 **Dr Philippa Martyr** was appointed to the position of Adjunct Senior Research Fellow in the School of Psychiatry and Clinical Neurosciences, UWA. The Clinical Applications Unit has appointed **Carole Harrison** as Senior Research Nurse.

Research Project Updates: On Friday 28 November, **Professor Assen Jablensky** and **Dr Vera Morgan** gave a 'master class' on grant-writing for CCRN staff, focusing on NHMRC grant applications and the UWA grant application process. In January, **Ms Kathryn McCabe** visited CCRN to undergo quality control training for the Australian Schizophrenia Research Bank project. **Deb Faulkner** has also submitted her doctoral thesis on 'Asymmetries in unimanual and bimanual coordination: evidence from behavioural and transcranial magnetic stimulation studies' (Psychology, UWA).

Media: In October 2008, **Dr Greg Price** was interviewed by Andrea Burns for Channel 7's *Today Tonight* programme, as part of a feature on the repetitive Transcranial Magnetic Stimulation (rTMS) clinical trial in progress. The piece went to air on Thursday 22 January 2009, and resulted in an immediate substantial response from interested members of the public. The therapy, which is a non-invasive alternative form of treatment for people with depression not responding to medication, has attracted significant interest and the results of the clinical trial are currently being compiled.