References

Aleman A, Larøi F (2008). *Hallucinations: The Science of Idiosyncratic Perception*. American Psychological Association: Washington, DC.

Bentall RP (2003). *Madness Explained: Psychosis and Human Nature*. Penguin: London.

Costello CG (1992). Research on symptoms versus research on syndromes: arguments in favour of allocating more research time to the study of symptoms. *British Journal of Psychiatry* **160**, 304–308.

Hoffman RE, Varanko M, Gilmore J, Mishara AL (2008). Experiential features used by patients with schizophrenia to differentiate 'voices' from ordinary verbal thought. *Psychological Medicine* **38**, 1167–1176.

Larøi F (2006). The phenomenological diversity of hallucinations: some theoretical and clinical implications. *Psychologica Belgica* **46**, 163–183.

Larøi F, Woodward T (2007). Hallucinations from a cognitive perspective. *Harvard Review of Psychiatry* **15**, 109–117.

Mojtabai R, Rieder RO (1998). Limitations of the symptom-oriented approach to psychiatric research. *British Journal of Psychiatry* **173**, 198–202.

Moritz S, Larøi F (2008). Differences and similarities in the sensory and cognitive signatures of voice-hearing, intrusions and thoughts. *Schizophrenia Research* **102**, 96–107.

Owen G, Harland R (2007). Theme issue on phenomenology and psychiatry for the 21st century. Taking phenomenology seriously. *Schizophrenia Bulletin* **33**, 105–107.

Parnas J, Bovet P (1995). Research in psychopathology: epistemological issues. *Comprehensive Psychiatry* **36**, 167–181.

Parnas J, Zahavi D (2002). The role of phenomenology in psychiatric classification and diagnosis. In *Psychiatric Diagnosis and Classification* (ed. M. Maj, W. Gaebel, J. J. López-Ibor and N. Sartorius), pp. 137–162. John Wiley & Sons: Chichester.

Persons JB (1986). The advantages of studying psychological phenomena rather than psychiatric diagnoses. *American Psychologist* **41**, 1252–1260.

FRANK LARØI
Cognitive Psychopathology Unit,
University of Liège, Boulevard du Rectorat (*B33*),
4000 Liège, Belgium
(Email: flaroi@ulg.ac.be)

Psychological Medicine, **39** (2009).
doi:10.1017/S0033291708004583
First published online 10 October 2008

Letter to the Editor

Strong evidence for multiple psychosis susceptibility genes – a rejoinder to Crow

There are many mis-representations of our position in Dr Crow's response (Crow, 2008) to our comment on his paper, but given recent empirical developments in genetic research (Maher *et al*. 2008), there is little need, and even less time, to engage in a protracted debate on whether there is a genetic basis to psychosis. In the last 2 months, a synthesis of genome-wide data and large sample sets has convincingly shown that common genetic variants, each of weak effect, are indeed involved in schizophrenia (O'Donovan *et al*. 2008) and bipolar disorder (Ferreria *et al*. 2008). Moreover, in schizophrenia, there is now consistent and compelling evidence (The International Schizophrenia Consortium, 2008; Stefansson *et al*. 2008) from molecular genetics for a contribution to risk from copy number variation (CNV), variants that result in the deletion or duplication of 1000 bases or more of DNA sequence. Read with an open mind, these recent papers should change Dr Crow's views.

While we make no argument that epigenetic changes are *not* involved at all, the molecular data clearly show genetic variation *is* involved. Moreover, the molecular data clearly point to the involvement in psychosis of multiple regions of the genome, not some single sex-linked part of the genome involved in language and speciation as Dr Crow has long proposed. It must surely now be the time for Dr Crow to reject his own hypothesis of a single cause of psychosis, and to use his well-earned reputation in whatever way he can to enhance the ability of geneticists, and epigeneticists (who are often the same people), to get on with the job of tackling the complexities of psychosis for the benefits of our patients.

Declaration of Interest

None.

References

Crow TJ (2008). Will whole genome association studies sink psychosis research? A response to Collier, Sullivan and O'Donovan [Letter]. *Psychological Medicine*. Published online: 12 August 2008. doi:10.1017/S0033291708004030.

Ferreira MAR, O'Donovan MC, Meng YA, Jones IR, Ruderfer DM, Jones L, Fan J, Kirov G, Perlis RH, Green EK, Smoller JW, Grozeva D, Stone J, Nikolov I, Chambert K, Hamshere ML, Nimgaonkar V, Moskvina V, Thase ME, Caesar S, Sachs GS, Franklin J, Gordon-Smith K, Ardlie KG, Gabriel SB, Fraser C, Blumenstiel B, Defelice M, Breen G, Gill M, Morris DW, Elkin A, Muir WJ, McGhee KA, Williamson R, MacIntyre DJ, McLean A, St Clair D, VanBeck M, Pereira A, Kandaswamy R, McQuillin A, Collier DA, Bass NJ, Young AH, Lawrence J, Ferrier IN, Anjorin A, Farmer A, Curtis D, Scolnick EM, McGuffin P, Daly MJ, Corvin AP, Holmans PA, Blackwood DH,

Wellcome Trust Case Control Consortium (WTCCC), Gurling HM, Owen MJ, Purcell SM, Sklar P, Craddock NJ (2008). Collaborative genome-wide association analysis of 10,596 individuals supports a role for Ankyrin-G (*ANK3*) and the alpha-1C subunit of the L-type voltage-gated calcium channel (*CACNA1C*) in bipolar disorder. *Nature Genetics* **40**, 1056–1058.

Maher BS, Riley BP, Kendler KS (2008). Psychiatric genetics gets a boost. *Nature Genetics* **40**, 1042–1044.

O'Donovan MC, Craddock N, Norton N, Williams H, Peirce T, Moskvina V, Nikolov I, Hamshere M, Carroll L, Georgieva L, Dwyer S, Holmans P, Marchini JL, Spencer C, Howie B, Leung H-T, Hartmann AM, Möller H-J, Morris DW, Shi Y, Feng G, Hoffmann P, Propping P, Vasilescu C, Maier W, Rietschel M, Zammit S, Schumacher J, Quinn EM, Schulze TG, Williams NM, Giegling I, Iwata N, Ikeda M, Darvasi A, Shifman S, He L, Duan J, Sanders AR, Levinson DF, Gejman P, Molecular Genetics of Schizophrenia Collaboration, Cichon S, Nöthen MM, Gill M, Corvin A, Rujescu D, Kirov G, Owen MJ (2008). Identification of novel schizophrenia loci by genome-wide association and follow-up. *Nature Genetics* **40**, 1053–1055.

Stefansson H, Rujescu D, Cichon S, Pietiläinen OP, Ingason A, Steinberg S, Fossdal R, Sigurdsson E, Sigmundsson T, Buizer-Voskamp JE, Hansen T, Jakobsen KD, Muglia P, Francks C, Matthews PM, Gylfason A, Halldorsson BV, Gudbjartsson D, Thorgeirsson TE, Sigurdsson A, Jonasdottir A, Jonasdottir A, Bjornsson A, Mattiasdottir S, Blondal T, Haraldsson M, Magnusdottir BB, Giegling I, Möller HJ, Hartmann A, Shianna KV, Ge D, Need AC, Crombie C, Fraser G, Walker N, Lonnqvist J, Suvisaari J, Tuulio-Henriksson A, Paunio T, Toulopoulou T, Bramon E, Di Forti M, Murray R, Ruggeri M, Vassos E, Tosato S, Walshe M, Li T, Vasilescu C, Mühleisen TW, Wang AG, Ullum H, Djurovic S, Melle I, Olesen J, Kiemeney LA, Franke B, Genetic Risk and Outcome in Psychosis (GROUP), Kahn RS, Linszen D, van Os J, Wiersma D, Bruggeman R, Cahn W, Germeys I, de Haan L, Krabbendam L, Sabatti C, Freimer NB, Gulcher JR, Thorsteinsdottir U, Kong A, Andreassen OA, Ophoff RA, Georgi A, Rietschel M, Werge T, Petursson H, Goldstein DB, Nöthen MM, Peltonen L, Collier DA, St Clair D, Stefansson K (2008). Large recurrent microdeletions associated with schizophrenia. *Nature* **455**, 232–236.

The International Schizophrenia Consortium (2008). Rare chromosomal deletions and duplications increase risk of schizophrenia. *Nature* **455**, 237–241.

M. C. O'DONOVAN, N. CRADDOCK AND M. J. OWEN
School of Medicine, Cardiff University, Heath Park, Cardiff, UK
(Email: wpcmod@cf.ac.uk)

https://doi.org/10.1017/S0033291708004583 Published online by Cambridge University Press