LETTER TO THE EDITOR

Reply to: can CBT substantially change grey matter volume in chronic fatigue syndrome?

Floris P. de Lange,1 Anda Koers,1 Joke S. Kalkman,2 Gijs Bleijenberg,2 Peter Hagoort,1,3 Jos W. M. van der Meer4 and Ivan Toni1,3

1F. C. Donders Centre for Cognitive Neuroimaging, Radboud University Nijmegen, The Netherlands, 2Expert Center Chronic Fatigue, Radboud University Nijmegen Medical Center, The Netherlands, 3Nijmegen Institute for Cognition and Information, Radboud University Nijmegen, The Netherlands and 4Department of General Internal Medicine, Radboud University Nijmegen Medical Center, The Netherlands

Correspondence to: Floris P. de Lange, PhD, F. C. Donders Centre for Cognitive Neuroimaging, Radboud University Nijmegen, Kapittelweg 29, 6500 HB Nijmegen, The Netherlands
E-mail: floris.delange@fcdonders.ru.nl
doi: 10.1093/brain/awn208
Received and Accepted August 1, 2008

Sir, We thank Dr Bramsen for her interest in our recently published article (de Lange et al. 2008). In this article, we report on an increase in prefrontal grey matter volume following cognitive behavioural therapy (CBT) in a group of patients suffering from the chronic fatigue syndrome (CFS).

Dr Bramsen raises two points of criticism. First, she questions the lack of a control group of patients receiving no treatment or a different treatment. While this limitation was already emphasized in the discussion section of de Lange et al. (2008), it remains unclear how the observed behavioral and cerebral changes could be accounted for by generic and CBT-independent factors. Dr Bramsen wonders whether the reported behavioural improvements are really the result of CBT, or whether they could be due to natural course or lifestyle changes, while the underlying disease process is not influenced by CBT. A large body of evidence suggests that this is not the case: there is overwhelming evidence in the literature from several carefully conducted randomized controlled trials (RCT) that demonstrate the specific efficacy of CBT for CFS (e.g. Sharpe et al. 1996; Deale et al. 1997; Prins et al. 2001). It was beyond the scope of this study to disprove that treatments other than CBT would have resulted in the same—or even better—results, simply because this possibility has already been tested and rejected (Whiting et al. 2001; Chambers et al. 2006).

The second point of criticism raised is that the structural changes in the brain are small, comprising <1% of the total brain volume. Dr Bramsen argues that, although statistically significant, these changes are unlikely to be clinically relevant. This argument is more an intuition than a scientific argument. Given the limited knowledge of structural plasticity in the adult human brain, it seems arbitrary to set an a priori threshold for clinical relevance. More importantly however, Dr Bramsen neglects the fact that the reported increase in grey matter volume was largely regionally specific, confined to left and right lateral prefrontal cortex [see Fig. 3 of de Lange et al. (2008)]. The increase in grey matter volume might appear numerically modest when expressed in terms of whole-brain grey matter volume. Yet, when relating the change to a more specific anatomical structure (the lateral prefrontal cortex), the increase in grey matter volume was on average 8%. Nevertheless, we prefer to focus on whole-brain grey matter volume as a dependent measure, as it is a reliable, sensitive and unbiased measure of overall cerebral morphology (Good et al. 2001; Chard et al. 2002).

In summary, while our study did not compare the efficacy of CBT in bringing about the behavioural and brain changes with other treatments or no treatment, there is an overwhelming amount of evidence from the literature that shows the specific efficacy of CBT. The size of the structural changes should naturally be interpreted in relation to the dependent measure used. Finally, we agree with Dr Bramsen that our results do open a wide array of new questions, like: ‘What is the long-term time course of these structural brain changes?’ and ‘Can successful CBT also lead to structural brain changes in other psychopathologies, e.g. depression?’ These exciting research questions will hopefully be the topic of future studies.

References
Chambers D, Bagnall AM, Hempel S, Forbes C. Interventions for the treatment, management and rehabilitation of patients with chronic