Psychological Medicine, 2004, **34**, 761–762.
Printed in the United Kingdom

CORRESPONDENCE

Psychological Medicine, **34** (2004).
DOI: 10.1017/S0033291703001521

To the Editor:

I wish to commend De Jager *et al*. (2003) for their study of neuropsychological measures in Alzheimer's disease (AD), vascular dementia (VaD) and Mild Cognitive Impairment (MCI). This information has been presented in a way that makes it truly useful to both clinicians and researchers. However, I have a few additional comments on their findings.

First, I note that measures with the most face validity as 'executive' tasks [(i.e. CLOX: An Executive Clock-drawing Task, Letter cancellation B (a test of Working Memory) and Map Search from the Tests for Everyday Attention (TEA) battery (a measure of selective attention)] could not distinguish AD from VaD. This is consistent with my impression that impairments in executive control function (ECF) are actually essential to the clinical diagnosis of dementia, regardless of its cause (Royall & Polk, 1998).

Part of my rationale for this position is the consensus opinion that the cognitive impairments of a dementia must be 'sufficient' to cause disability. Measures of ECF, including CLOX1, are robust correlates of both cross-sectional (Royall *et al*. 2000) and longitudinal (Royall *et al*. in press *c*) models of functional capacity. Thus, ECF should not be expected to distinguish between different dementing diagnoses, with the caveat that they are matched to functional status (Royall *et al*. 1993).

It is an empirical question whether any other cognitive domain can attenuate or add additional variance to ECF's contribution to multivariate models of functional status, and thus qualify as a putative 'dementing' cognitive impairment. Cognitive impairments that do not contribute to such models cannot claim to be part of the dementia syndrome, because they do not contribute to disability, independently of ECF (although they may yet be useful in the clinical discrimination between dementing disorders). Not even all putative ECF measures may meet this criterion, as there are multiple dimensions of ECF in factor analyses, and not all of these are statistically associated with functional status (Royall *et al*. 2002; in press *a*). De Jager *et al*.'s (2003) finding that CLOX1 (but not CLOX2, a non-executive measure scored on the same metric as CLOX1) discriminates AD and VaD from both MCI and controls, but not from each other, is consistent with this model.

Second, I note that many cognitive measures, including ECF measures like CLOX1, discriminate MCI from controls. MCI was originally defined by isolated memory impairment (Petersen *et al*. 1999), but non-amnestic patterns of 'MCI' are increasingly being recognized. We have recently shown that 25–35% of non-institutionalized elderly retirees with memory performance $\leqslant 1{\cdot}5$ standard deviations (S.D.) below an age-specific normative mean, also have similarly severe impairments in ECF (Royall *et al*. in press *b*). Moreover, an additional fraction with isolated ECF impairments is as common as isolated memory impairment. If ECF impairment is associated with decreases in functional status, why should such cases not already be diagnosed as demented? The answer seems to be that functional status is typically measured insensitively, with nothing more than the Clinical Dementia Rating Scale (CDR) (Hughes *et al*. 1982).

Finally, I would make the point that neither CLOX1 [which De Jager *et al*. (2003) found to be sensitive to dementia] nor CLOX2 [which De Jager *et al*. (2003) found to be specific] was meant to be used as a single instrument for the discrimination between demented and non-demented persons, or between demented persons with different diagnoses. Instead, they were meant to be combined into a two-dimensional (four minute) assessment of cognition. Thus, the pattern of performance on CLOX1 and CLOX2 has been found to successfully perform a three-way discrimination between AD, VaD

and well elderly controls (by discriminant analysis: Wilks' lambda, $\lambda = 0.41$, $F = 17.2$, $p < 0.001$; 74.5% correctly classified by resubstitution relative to full dementia work-ups) (Royall, 2002).

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Psychological Medicine, **34** (2004)
DOI: 10.1017/S0033291704002533

ADDENDUM

Aish, A.-M. & Wasserman, D. (2001). Does Beck's Hopelessness Scale really measure several components? *Psychological Medicine* **31**, 367–372. The analyses published in this Brief Communication are based on the material collected in Sweden in Stockholm (202 cases) and in Umeå (122 cases).

In the final version, following the reviewer's comments, when the article was shortened and accepted for publication as a Brief Communication, the name of one of the authors, Ellinor Salander Renberg, was omitted due to an oversight. The authors wish to make it clear that this Brief Communication had three authors. They also acknowledge Ellinor Salander Renberg for giving written approval to use the cases collected in Umeå, before commencement of the analyses.