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■ COMMENTARY

Reynolds, D., Nicolson, R. I.  
and Hambly, H. (2003).  
Evaluation of an Exercise-  
based Treatment for Children  
with Reading Difficulties

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The exercise regime that Reynolds *et al.* have studied is that developed and implemented by the dyslexia, dyspraxia and attention deficit treatment (DDAT) Centre, founded by Wynford Dore. The treatment is controversial and causes concerns within academic and educational circles, particularly because of sensational media reports about its claimed efficacy and because of the not insubstantial cost of the treatment to clients. We welcome the opportunity for academics to take this issue out of the media frame and discuss it in a more appropriate arena.

The high incidence of reading difficulties and the importance of literacy skills for success in today's society are impelling reasons for scientists to thoroughly evaluate any potentially effective new intervention, no matter how unconventional it may appear. Traditional approaches have been heavily influenced by the phonological processing deficit hypothesis, which has inspired treatment programmes that focus primarily on the development of phonological processing skills. However, while such interventions are helpful for many, the evidence suggests that approximately one third of children continue to experience difficulties in spite of intensive, phonologically based treatment. The emergence of the cerebellar deficit theory (Nicolson, Fawcett, & Dean, 2001) makes it reasonable to consider complementary methods of intervention that target, not only phonological skills, but also balance and motor skills. The question is, whether it is possible for such intervention to impact upon, not just the difficulties with balance and motor skills that are directly targeted, but also cognitive skills and literacy skills that are not.

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Reynolds *et al.* report an evaluation of an exercise-based approach to the remediation of 'dyslexia-related disorders'. It is concluded that the treatment exerts direct effects on balance, dexterity and eye-movement control and that the benefits transfer significantly to cognitive skills underlying literacy, to the reading process and to standardized literacy attainment tests. While there is support in the data reported for the claims relating to a direct influence of treatment on balance and motor skills, the claims for significant 'near' and 'far' transfer cannot be justified. The methodological limitations of the study go far beyond those listed by Angela Fawcett in her editorial comment and it is misleading to draw such strong conclusions.

Nevertheless, while this study does not provide unequivocal support for the efficacy of a specific (although not specified) exercise intervention on the cognitive skills underlying literacy or on literacy itself, that does not mean that exercise interventions do not have a role to play in the treatment of dyslexia and related developmental disorders. Indeed, exercise intervention is not new. Several researchers have implemented exercise intervention programmes that have been designed to ameliorate developmental difficulties of a dyslexic, dyspraxic and/or attention deficit nature (e.g. Blythe, 2003; Byl, Byl, & Rosenthal, 1989; Macintyre, 2000; McPhillips, Hepper, & Mulhern, 2000) and all report positive effects. Blythe (2003), for example, describes Attention, Balance and Coordination as the essential ABC on which all later learning depends and reports a comparison between a group of 34 primary aged children who participated in a 10–15 min daily exercise regime at school for one academic year and a control group who did not. Blythe reports significant reductions in signs of problems with balance, coordination and reflexes in the experimental group, accompanied by marked improvements in speed of visual processing, auditory processing and visual associative processing. The control group showed only minimal change on the same measures.

The fact that the Reynolds *et al.* study has fairly obvious limitations will hopefully not deter, but rather prompt, open-minded, objective research in order to take this work forward. Only through adherence to strict scientific procedures will we eventually establish whether exercise intervention regimes have any potential for ameliorating dyslexia-related disorders. It is the responsibility of researchers to ensure that future work is clear about exactly which disorder is being treated, which aspects of the disorder are affected by treatment and exactly what the treatment is. If exercise intervention of some description is shown to be an effective treatment for specific dyslexia-related disorders, then neuroimaging techniques will be required to establish the exact mechanism that mediates that effect.

A recent article by Pope and Whiteley (2003) reviews the research into the causes of specific reading difficulties and considers whether or not there is any theoretical basis for the use of exercise-based intervention programmes. The article concludes that such unconventional methods draw some theoretical support from the scientific literature, but it warns against comorbidity issues and concludes, as we reiterate here, that there is a need for more rigorous and independent evaluation of exercise-based interventions. We believe that the Reynolds *et al.* study is best viewed as a preliminary investigation which will hopefully stimulate the appearance of an accumulating body of converging evidence to finally establish the worth, or not, of exercise based interventions.

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