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This commentary is on the article by Hill et al. on pages 929–934 of this issue.

The intervention study by Hill et al.[1] provides an important basis on which to consider further the idea not only of the beneficial effects of exercise on cognitive achievement, but also of how best to provide exercise opportunities to those children who need them most. While in the past we might have assumed that this applied to those who do not access physical exercise out of school, it is becoming increasingly clear that physical exercise, as well as motor development more generally, is closely related to physical and mental health, as well as to cognitive achievement. Considering first the impact of motor development, it is now evident that even within the first months of life motor development is closely associated with language development.[2] In addition, a recently published analysis of the Millennium Cohort Study highlights the importance of such relationships still further, showing that delayed attainment of key motor milestones at just 9 months of age is significantly associated with poorer cognitive development at 5 years of age.[3] This points to the complex relationship between motor skill and development more generally, as well as emphasizing how the contribution of skill (or difficulty) in one domain has a positive (or negative) impact on development in other areas. This interaction, with motor skill arguably at its heart, should not be underestimated. Indeed, even in adults, significant brain changes can be seen over a short period of training (e.g. in juggling).[4]

Motor development, and its impact on other areas of physical and mental health as well as cognitive achievement, is also a central area of focus for those working with children with neurodevelopmental disorders. Hill et al.[1] mention attention deficit–hyperactivity disorder, and other pertinent disorders include developmental coordination disorder (sometimes referred to as dyspraxia) and autism spectrum disorder. Such children experience significant motor and/or attention difficulties with suggestions of varying cognitive profiles. Classroom interventions that do not single out specific children, and appear to benefit all children, will be crucial in improving outcome for all.

A further point worthy of note relating to this study is the opportunity that it affords to consider the nature of a suitable exercise programme. An exercise programme such as the one reported here, administered en masse, and with positive effects observed in a large sample, is extremely promising in this regard. This is particularly the case if further extensions of this work support the authors' 'arousal explanation' given for the observed group × intervention interaction. Of course, further manipulations would be useful (e.g. Is 30 min of exercise necessary? Could different exercises be used as effectively? Are certain groups of children benefited more or less by such a programme?). However, the classroom exercise programme reported by Hill et al. could be highly beneficial given its ease of administration and the impact of physical exercise on cognitive achievement and physical and mental health outcomes in the short and longer term.

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Clinical assessment of dynamic hand control in pediatrics

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As children learn to manipulate utensils for writing tasks and self-care activities, dexterity gradually improves. To manipulate stable or unstable objects successfully we rely on the friction inherent within the digit–object interface while simultaneously increasing the grip force in our opposing fingers and thumb to prevent slips or drops.[1,2] Manipulation of static tools such as pencils with erasers can be successfully achieved by most children, whereas manipulation of self-care items such as fingernail clippers or tweezers is often more difficult to master. Until a child learns to control the direction and strength of opposing