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Children are still fit, but not active!

Twenty two years ago I argued in *Education and Health*, somewhat controversially at the time, that children were "fit but not active" (Armstrong, 1989). So I read with interest Larouche's article - 'Are today's children fit and active?' - in the last issue of *Education and Health*, the primary purpose of which was to determine if such a statement would still be tenable in 2011. He concluded that, 'Current evidence clearly suggests that today's children are both inactive and increasingly unfit' (Larouche, 2011; p.33). Is he correct?

To evaluate fully this statement readers of *Education and Health* should read the timely Special Issue of the *British Journal of Sports Medicine* to be published in September 2011. The Special Issue is devoted to the International Olympic Committee (IOC) consensus statement on the 'Health and Fitness of Young People through Physical Activity and Sport' and includes the 11 invited expert reviews of the scientific literature which underpin the consensus statement. The IOC consensus statement concludes that:

- i) the assessment and interpretation of young people's physical activity (PA) is extremely difficult and that current methodology might not assess PA in all domains,
- ii) only 30-40% (PA assessed subjectively) or even 25% (PA assessed objectively) of young people satisfy current health-related PA recommendations,
- iii) recent studies suggest that young people's PA levels have not declined

during recent decades,

- iv) there is no evidence to suggest that young people have low levels of aerobic fitness or that they are less aerobically fit than young people of previous generations, and
- v) there is no meaningful relationship between habitual PA and aerobic fitness (Mountjoy et al., 2011).

In other words, the majority of today's children are fit but not active and fitness and habitual PA are not deteriorating over time!

But back to the two *Education and Health* papers (Armstrong, 1989; Larouche, 2011) using Larouche's headings:

Physical activity

What is presented in this section is generally sound but when interpreting young people's physical activity levels it is wise to keep in mind that, as eloquently argued by Twisk (2001), current health-related PA recommendations are 'evidence-informed' rather than 'evidence-based'. It is unfortunate that Larouche does not draw attention to the fact that the team which collected the data reported in Armstrong (1989) re-visited the same communities 10 years later and provided the first indication that young people's PA levels had stabilised (Welsman & Armstrong, 2000). This finding has been confirmed in several subsequent studies (see Ekelund et al., 2011) and is reflected in the IOC consensus statement. Nevertheless, the two papers are in agreement in concluding that the majority of young people do not satisfy current health-

related PA recommendations (see Armstrong & Welsman, 2006 for an analysis of young people's PA levels across Europe).

Physical fitness

Both papers refer to health-related and performance-(or skill)-related components of physical fitness (PF) but focus on aerobic (or cardio-respiratory or cardiovascular) fitness. The best single measure of young people's aerobic fitness is peak oxygen uptake (see Armstrong and Welsman, 1994).

Larouche (2011) states that, 'there is increasing evidence suggesting that children's and adolescents' fitness levels have decreased significantly during the last decades' (p.32) but he unwisely cites data from so-called 'aerobic performance' tests such as the 20m shuttle run rather than direct measures of aerobic fitness to support his assertion. Recent evidence confirms that performance on this type of test has significantly declined since 1975 but performance test scores are not a direct measure of aerobic fitness. Performance tests are influenced by a network of environmental, behavioural, physical, biomechanical and psychosocial factors as well as physiological variables. In particular, there has been a worldwide increase in young people's fat mass over this time period (e.g. Olds, 2008). As performance tests monitor the ability to move body mass over measured distances it is no surprise to find that increases in fat mass have been shown to explain 60-70% of the decline in aerobic performance test data (Albon et al., 2010). This is not to say that a decline in young people's aerobic performance is not important, it is, but it is inaccurate and misleading to claim that it is directly due to a decrease in aerobic fitness.

In 1989, Armstrong argued that there was no evidence that young people have low levels of aerobic fitness or that their aerobic fitness had deteriorated over time. Twenty two years later this remains accurate as

there is still no evidence to suggest that young people's aerobic fitness is either low or deteriorating (see Armstrong et al., 2011 for a detailed analysis of the literature).

Association between physical activity and physical fitness

In 1989, Armstrong argued that any relationship between young people's aerobic fitness and habitual PA remained to be proven. Numerous studies since 1989 have analyzed young people's peak oxygen uptake in relation to their habitual PA and consistently shown no meaningful relationship between them (see Armstrong et al., 2011 for a review of the scientific literature). In the most comprehensive study to date, the Amsterdam Growth and Health Study studied young people longitudinally over a 15 year period and concluded that, 'no clear relation can be proved between PA and maximal oxygen uptake in free living males and females' (Kemper & Koppes, 2004, p.163).

Larouche states that, 'there is evidence suggesting that increasing PA can enhance PF. Indeed several studies in which children have been assigned to short-term training programs have shown increases in cardiovascular fitness' (p.33). This is of course correct but irrelevant to the argument as exercise training is not habitual PA. Armstrong & Barker (2011) have recently published the systematic review which underpinned the IOC consensus statement on Training the Elite Young Athlete (Mountjoy et al., 2008). The IOC concluded that the only component of young people's aerobic fitness on which there are sufficient data to estimate a dose-response relationship with exercise training is peak oxygen uptake and to elicit significant changes in this physiological variable exercise intensities in the range of 85-90% of maximal heart rate are required. As was identified in Armstrong's (1989) paper and verified over several years (e.g. Armstrong

& Welsman, 2006) young people's habitual activity PA levels do not reach the intensity, duration and frequency of activity required to enhance aerobic fitness.

What can schools do to address these issues?

Both papers concluded with sections on promoting more active lifestyles and with the increase in young people's body fat this remains at least as important in 2011 as it was in 1989. However, effective and credible PA promotion programmes for young people must be based on sound scientific foundations. The IOC consensus statement and its expert supporting reviews provide the latest scientific evidence and not only strongly reinforce Armstrong's (1989) statement that children are fit but not active but indicate that young people's fitness and PA are not deteriorating over time.

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