

More Than 10 Years After “The Horse is Dead . . .”: Surely It Must Be Time to “Dismount”?!

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This article represents a response to an editorial piece written in *Pediatric Exercise Science* over 10 years ago by Thomas Rowland in which he debated fitness testing and asked whether the “horse” of fitness testing in schools was dead. Here, the authors revisit the debate and consider the progress that has been made with regard to fitness testing in schools in recent years. On the basis of findings from the literature and some of their research, the authors suggest that accepting the fact that the horse is dead would not be a bad thing. Their advice is certainly to pull tightly on the reins, slow the horse down, and not allow fitness testing to dominate schools’ efforts to promote physical activity.

Over 10 years ago we read with interest an editorial piece in this journal by Thomas Rowland (40) that debated fitness testing for children. Corbin, Pangrazi, and Welk, in an article titled “Toward an Understanding of Appropriate Physical Activity Levels for Youth,” proposed a shift from a fitness to a physical activity promotion, or the lifestyle physical activity model (LPAM) (17). In response, Rowland questioned the impact this model had on the role of fitness testing of school children. His discussion centered on the role of testing in the promotion of physical activity, arguing that the model served as “the best argument for abandoning the routine field testing of children” (p. 119). He concluded by asking “is the ‘horse’ of exercise testing in the schools dead?” and, if so, suggested “perhaps we should ‘dismount’” (p. 119).

Rowland was certainly not alone in his concerns. In particular, his editorial provoked a response by Corbin, Pangrazi, and Welk (17) in which they supported and elaborated on many of the points Rowland made. In addition, issues have been debated and concerns have been expressed over fitness testing children by numerous other researchers and organizations over the years (e.g., 5,7,8,11,13,20,22,25,26, 31,37,41,43). More recently, Keating has claimed that unless youth fitness testing actually improves fitness and increases involvement in physical activity, the need for it is questionable (31).

Despite the concerns and Rowland’s suggestion over 10 years ago to perhaps “dismount” the fitness testing horse in schools, testing has been and continues to

be common place in the PE curriculum (6,10,14,24) with most secondary-school programs including compulsory testing (10,14,24,39). Advocates of such testing claim that it promotes healthy lifestyles and physical activity; motivates young people to maintain or enhance their physical fitness or physical activity; facilitates goal-setting, self-monitoring, and self-testing skills; promotes positive attitudes; and enhances cognitive and affective learning (35,47).

In this article we revisit the debate and consider the progress that has (or has not) been made with regard to fitness testing in schools. In particular, we consider whether the routine field testing that typically takes place during curriculum time has a role to play in the promotion of physical activity and is compatible with the LPAM. Our discussion endeavors to present a United Kingdom perspective and focuses on a few key issues and the related evidence presented in the literature. In addition, to further inform the debate and exemplify key points we draw on selected findings of two research projects we have been involved in recently. The first project was a monitoring study that involved a national survey of fitness (as well as physical activity and health) monitoring in over 300 secondary schools in England and follow-up interviews with PE teachers from approximately 20 schools (14). The second project was commissioned by the National Assembly for Wales and aimed to determine the feasibility of carrying out a research project on the fitness levels of Welsh children (27). This feasibility study was based on a world-wide review of literature and a survey and interviews with 35 key stakeholders (including experts). On the basis of these, we consider whether or not it is time to take the horse by the reins, accept that the horse is dead, and dismount once and for all.

Methodological Limitations

One argument in favor of dismounting the horse, which was alluded to by Rowland (40), relates to the methodological problems associated with fitness testing children. Fitness tests are plagued by methodological limitations, and the validity and reliability of some tests, test batteries, and the application of norm- or criterion-referenced standards with children have been questioned (18,22,31,38,40,41,42). These limitations stem from the many factors that influence performance and are reflected in fitness-test scores (e.g., the environment or test conditions, test protocol, motivation, skill, heredity and genetic potential, maturation) (19,33).

Such limitations were also widely acknowledged by stakeholders in the feasibility study. One stakeholder said "The extrapolation of field test data is fraught with problems" (27, p. 32). Another said

Even in a well-equipped sports science laboratory using "scientific" tests, one might consider the error to be around 10%. In the field situation using simpler methods (e.g., sit-up tests or shuttle runs), the error is likely to be huge. (p. 32)

Problems concerning the measurement of physical fitness in young people have led some to conclude that tests suitable for use in the school environment that provide valid and objective measures of fitness are simply not available (8,9,37). Given that such limited faith can be placed in the data, we argue that the use of fitness testing for promoting physical activity is also limited.

The Relationships Between Physical Fitness, Physical Activity, and Health

Fitness testing in schools might have assumed such popularity as a result of the growing concerns over young people's physical fitness, physical activity, and the implications of these for their health. Some of the concerns, however, are ill founded. It is still often incorrectly assumed that children's fitness is primarily a reflection of the amount of activity they do, and that those who score high on fitness tests are active and those who do not are inactive (33). This belief was evident amongst some of the teachers in the monitoring study, illustrated by the following remark: "Because the more active the children are, the better their fitness level is going to be" (14).

Although physical activity is an important variable in physical fitness development for adults (33), the relationship between fitness and activity among children is low (9). The reason probably lies in the low level of physical activity of most young people (9). Problems can arise if fitness-test scores are linked to activity levels. An active child who scores poorly on a test might become demotivated and turned off activity because he or she feels it does not pay off (16), whereas an inactive child who scores well might be delighted with the outcome, conclude that everything is alright when it is not, and might not be motivated to change.

In addition, efforts to advocate fitness testing as a result of concerns over young people's physical fitness and the implications of this for their health are misguided. According to Cale and Harris (13), much media attention and hype have been afforded to young people's fitness with messages leading us to believe that today's youth are unfit, unhealthy, and far less fit than in previous decades. Following a review of related literature, however, they declare that "there is no evidence to suggest that low levels of aerobic fitness are common amongst young people" and "no convincing evidence to suggest that young people's aerobic fitness has declined over time" (p. 32). On this issue, Corbin (16, p. 139) suggests that the media "likes bad news" and that "much talk about lack of fitness of our youth is hyperbole."

The data from both the monitoring and feasibility studies also revealed some confusion in this respect. Teachers commented, "Young people aren't as fit as they should be" and "It is obviously a government issue at the moment . . . the whole range of fitness and how unfit we are as a society. As PE educators we need to address that and try to make children aware of it" (14).

Furthermore, the implications of children's fitness and fitness-test scores to their health are not well established. In 1995 Rowland highlighted how the link between performance fitness and health outcomes was weak and how testing was therefore "archaic and inconsistent with our current understanding of the exercise-health connection" (40, p. 199). To date, the link between fitness in youth and health status is still not supported in the literature (22). There still remains only weak evidence that physical fitness is related to health in young people (45), and there is little or no direct evidence that physical fitness during childhood and adolescence is related to adult health (44,45). Again, confusion was evident amongst some individuals in both studies with one stakeholder claiming that "in terms of the health of our nation, we really do need to look at the fitness of our youngsters very, very seriously" (27, p. 48).

This, in addition to evidence that a sizeable proportion of young people are inactive and lead sedentary lifestyles, suggests that there is a need to focus attention on influencing young people's physical activity behavior (13). In other words, we need to adopt the LPAM, in which emphasis lies on the process of physical activity rather than on the product of fitness. From a physical activity promotion and LPAM perspective, a number of good reasons have been cited for focusing on physical activity rather than fitness (12,16,33,40). For example, physical activity influences children's health more than fitness; promoting physical activity is more likely to be acceptable to the general public and, in particular, to those who are sedentary or have low fitness levels; the focus on fitness that was common practice for many years was largely unsuccessful; and increased physical activity is an outcome that can be achieved by all children.

The Influence of Fitness Testing on Young People

From the perspective of the LPAM the influence of fitness tests on young people's physical activity behavior and their attitudes and motivation towards and knowledge and understanding of physical activity and physical fitness would seem crucial. To date, however, research has largely ignored the effects of youth fitness testing in schools (31). Keating claims that in the United States three facts cast doubt on the role of fitness testing in promoting physical activity (and improving youth fitness): (a) children have failed to show improvements in fitness and have become less physically active, (b) the percentage of overweight youth has increased substantially in recent years, and (c) the proportion of inactive adults has also increased dramatically (31).

Individuals in both the monitoring and feasibility studies acknowledged the potential motivational role of fitness testing on young people. For example, a stakeholder felt that fitness testing "can be motivational if health-related, linked to physical activity, and used in the right way" (27, p. 30), whereas a teacher explained

I think on the whole it's proved to be quite positive. Generally they like to look at their progress, and over the year they do three or four tests and then they can see if they improved. So they usually quite enjoy it on the whole. (14)

Despite anecdotal support for this notion, however, concern has been expressed that fitness testing might be repetitive and boring (31) and demotivating and counter-productive to the promotion of active lifestyles in young people (17,19,40). This point was made most strongly by Rowland (40) in his editorial that argued that fitness tests are antithetical to the goal of promoting physical activity because they can be demeaning, embarrassing, and uncomfortable for children (often those for whom there is most concern) and might reinforce the notion that exercise is competitive and unpleasant. Keating (31) warns of problems relating to lack of privacy with testing and test results, whereas Corbin, Pangrazi, and Welk (17) warn that testing that is done improperly might turn many youngsters off rather than on to activity.

The potential negative consequences of fitness testing were also commonly reported by teachers and stakeholders. Teachers expressed concerns over the negative impact of testing on lower ability and overweight children in particular, whereas stakeholders warned how tests can demotivate, be perceived as threatening,

cause discomfort and stress, label and embarrass children, make them look daft, and turn or switch them off. One teacher said “if they learn from it in a positive way, it’s good. If they learn that they are unfit, overweight, can’t do PE, then it’s a very negative way. It has to be used with considerable caution” (14). A stakeholder commented:

PE teachers who use fitness tests regularly on any and every group of children should be encouraged to stop! Children often hate and dread them, they don’t tell us very much, and why should children be forced to endure them? (27, p. 43)

Despite their concerns, little attention has been paid to the motivational effects of fitness testing (21,30) or fitness-test awards on young people (31), and the need for such research has long been recognized (34). Studies that have been conducted (1,23,32,46) have revealed variable results, and it has been concluded that motivational enhancement from testing cannot be taken for granted (23), and there is no empirical data to indicate that students value fitness-test awards (31). Attitudes towards fitness tests have been found to be unfavorable (32), and some youngsters (and teachers) have been accused of not taking testing seriously (31). The motivation of young people towards testing has been found to be influenced by feedback following tests, perceived competence (46) or perceived success, and achievement-goal orientation and performance in the tests (23). The variable influence of fitness testing on some youngsters was recognized in the monitoring study with one teacher making the following observation: “The top half of the group, they’re much more into the testing. I think it does influence some of them” (14).

Pate (34) believes that the most important reason for administering fitness tests to children is to facilitate learning in the cognitive and the affective domains in terms of equipping them with the knowledge and understanding required for participation in a physically active lifestyle. He and others suggest that these aspects, regrettably, are usually given the least attention and are often overshadowed in fitness-test programs (31).

PE teachers and stakeholders similarly acknowledged the value of fitness testing in enhancing learning with responses including “to aid learning” and “to inform pupils about their own relative fitness levels.” One teacher remarked that through fitness testing students were able to “learn a lot about the effects of exercise on the body, for example recording their heart beat and recovery rate and pulse testing” (14).

Even less research attention has been paid, however, to the educational role of fitness testing. Only one study can be cited that investigated what children thought, felt, and knew about the mile-run test, and it revealed that they generally showed little or no understanding of why they were being asked to complete the test (29).

So, Is the Horse Dead and Is It Time to Dismount?

From the preceding discussion it seems that fitness testing in schools might not be compatible with the promotion of active lifestyles and the LPAM. There is little evidence that fitness tests provide meaningful data; positively influence children’s

physical fitness, physical activity, motivation, or knowledge and understanding; or that there are meaningful relationships between physical fitness and physical activity or physical fitness and health. Keating agrees, claiming that, unfortunately, little empirical evidence is available to show that fitness programs really work for children and youth in schools (31). To the contrary, fitness testing can be counter-productive in that it can be unpleasant, embarrassing, and meaningless for many young people, and scores can be inaccurate, misleading, unfair, and demotivating (13). In this respect, we agree with the sentiments of Rowland (40) that fitness testing in schools should be carefully reexamined. What is disappointing, though, is that over 10 years have passed, and, certainly in the United Kingdom, many of us seem none the wiser or clearer on the issue.

This said, however, if appropriately employed, there is no reason why fitness testing could not play a role in supporting active lifestyles and the LPAM. In 1995, Corbin, Pangrazi, and Welk (17) were likewise of the opinion that fitness testing might survive if it could be shown to promote the right philosophy, suggesting that “there may be some life left in the horse” (p. 350) if certain considerations are made before testing. They asked “Is it the testing itself that is ‘bad’ or the way in which it is done?” (17, p. 348). An interviewee in the feasibility study held similar views: “I’m not against knowing where we are with regard to our children’s fitness but I am against how it could possibly be done, and I’d hate it to be misused along the way” (27, p. 45).

Concerns have been expressed about the way in which fitness tests are often implemented in schools—too often tests are an almost irrelevant adjunct to the curriculum or dominate or constitute the entire fitness-education program (35). Indeed, the amount of time schools spend on fitness testing without necessarily positively influencing young people’s activity levels or their attitudes has been criticized (12,26,31), and it has been suggested that PE time could be used more wisely (13).

Pate (35) noted that, despite its popularity for a number of years, there is little scientific evidence to guide us in deciding how best to incorporate fitness testing into PE. Little has changed in the last 10 years, at least in the United Kingdom. Recommendations concerning the implementation of fitness testing with young people have been made by a number of researchers and organizations (e.g., 2,3,4,5,13,17,25,28,35,36), but these have been based more on common sense than on scientific evidence. We believe that if fitness tests are to have a role in schools, teachers need clear guidance, support, and training in the implementation of fitness testing and, in particular, in how to use fitness testing to achieve cognitive, affective, and behavioral objectives. This view was also supported by the teachers and stakeholders, with several highlighting the need for appropriate guidance and support materials to assist teachers, including programs to work from. One teacher commented, “I think we need more formal guidance some sort of national program . . . with a common structure across all schools” (14). One stakeholder in the feasibility study reported:

There is a need to convert the extensive detailed scientific knowledge about fitness testing into appropriate educational tools so that teachers (and coaches) can be provided with material that allows them to offer children a contemporary understanding of the facts and issues. (27, p. 42)

There have been very positive developments in this respect in the United States with the production of fitness resources for teachers such as Physical Best (2,3,4) and FITNESSGRAM/ACTIVITYGRAM (www.fitnessgram.net) (15). The resources represent comprehensive fitness education programs that recognize the importance of physical activity and the LPAM, as well as fitness, by seeking to develop the affective, cognitive, and behavioral components associated with physical activity participation. The latest version of FITNESSGRAM/ACTIVITYGRAM (8.0) includes fitness and activity assessments and reporting programs, and the accompanying reference guide provides guidance on the appropriate and inappropriate use of the resource. Teachers in the United Kingdom need and would welcome equivalent resources.

In summary, and from the viewpoint of promoting physical activity and the available evidence, we feel that accepting that the fitness testing horse is dead and dismounting once and for all would not be a bad thing, and the time often devoted to testing could be better spent. That said, research in this area is still relatively scarce. More studies on the effects of fitness testing in schools are therefore needed to guide the nature and implementation of future testing. Until such a time and until a stronger evidence base and more definitive guidance becomes available, however, our advice is certainly to pull tightly on the reins, slow the horse down, and not allow fitness testing to be the front runner and dominate schools' efforts to promote physical activity. Instead, we would welcome more time and energy being afforded to teaching young people knowledge, understanding, physical and behavioral skills, and fostering the attitude and confidence associated with current and lifelong participation in physical activity, via actively involving them in a range of purposeful activities.

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Commentary

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Rowland's call to abandon the routine field testing of physical fitness among youth in schools was made more than a decade ago (5). Rowland's article highlighted the many potential abuses of fitness testing, the lack of reliability and validity of many youth fitness tests, and the lack of evidence supporting links between health and fitness among youth. Because Rowland advocated an emphasis on a lifetime physical activity model (LPAM), a model that I jointly proposed with colleagues Bob Pangrazi and Greg Welk, my colleagues and I were asked to respond to Rowland's editorial. In that article we supported many of the points made by Rowland. We particularly agreed that those who use fitness tests should focus on promoting lifelong physical activity (2). At that time we suggested that, done properly, fitness

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