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*Fitness testing in physical
education – a misdirected
effort in promoting healthy
lifestyles and physical
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1 **Title**

2 Fitness testing in physical education – a misdirected effort in promoting healthy
3 lifestyles and physical activity?

4

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18 **Key words**

19 Fitness; fitness testing; physical activity promotion; physical activity; healthy
20 lifestyles; children

21

22

23

24

25 **Fitness testing in physical education – a misdirected effort in promoting**
26 **healthy lifestyles and physical activity?**

27

28 **Abstract**

29 *Background*

30 Physical fitness testing is commonplace within schools and the Physical Education
31 (PE) curriculum, with advocates claiming one of the key purposes of testing to be
32 the promotion of healthy lifestyles and physical activity. Despite this, much
33 controversy has surrounded the fitness testing of young people.

34

35 *Purpose*

36 This paper draws on selected findings of a recent 'fitness testing children feasibility
37 study' to explore the key issues, concerns and debates regarding fitness testing,
38 as they relate to encouraging a physically active lifestyle.

39

40 *Research Design*

41 The feasibility study was commissioned by the National Assembly for Wales and
42 involved two main parts: a comprehensive review of literature (using metalib) to
43 establish the key findings/issues, and consultation with key 'stakeholders' and
44 'experts' to ascertain their views, understanding and experiences of fitness testing
45 children. The consultation was carried out via questionnaires and interviews.

46

47 *Data Analysis*

48 The key issues and themes emerging from the literature from 1985 onwards were
49 identified and served as the evidence for the debate. The questionnaire and
50 interview data were analysed by quantifying the questionnaire responses and
51 identifying the common issues and themes emerging from the transcripts (and the
52 open items within the questionnaires). These were then used to reinforce,
53 substantiate and illustrate key points.

54

55 *Findings*

56 The findings reveal that the role fitness testing plays in PE in promoting healthy
57 lifestyles and physical activity is questionable and cannot be taken for granted. For
58 example, little evidence was found to support the notion that fitness tests promote
59 healthy lifestyles and physical activity, motivate young people, and develop the
60 knowledge and skills that are important to the sustained engagement in an active
61 lifestyle.

62

63 *Conclusion*

64 Based on the evidence, the paper concludes that much of the fitness testing
65 carried out in PE may well represent a misdirected effort in the promotion of
66 healthy lifestyles and physical activity, and that PE time could therefore be better
67 spent.

68

69

70

71 **Introduction**

72 Schools are acknowledged as the primary institution with responsibility for
73 promoting physical activity in young people (McBride & Midford, 1999; Sallis &
74 Owen, 1999; Cardon & Bourdeaudhuij, 2002) and school physical education (PE)
75 in particular is recognized as having a key role to play (see for example, Cale,
76 2000; Shephard & Trudeau, 2000; McKenzie, 2001; Cardon & Bourdeaudhuij,
77 2002; Green 2002; 2004; Cale & Harris, 2005). Green (2002, p. 95) for example,
78 refers to the 'taken-for-granted role of PE in health promotion', and McKenzie
79 (2001) views PE as the most suitable vehicle for the promotion of active, healthy
80 lifestyles among young people. Clearly though, if PE is to be successful in this
81 regard, then the content and delivery of the curriculum is critical and it is important
82 that young people are provided with the knowledge, understanding and skills
83 required for lifelong participation in physical activity and with positive, meaningful
84 and relevant physical activity experiences that will foster positive attitudes and
85 confidence. Indeed, Green (2004) acknowledges how the popularity of sport and
86 physical activity among young people, both now and in the future, remains
87 contingent upon them being 'presented appropriately...' 'not least within PE' (p.
88 74).

89

90 Physical fitness testing is commonplace within schools and the PE curriculum
91 (Harris, 1995; ACSM, 2000), with most secondary schools including it as a
92 compulsory component of their PE programmes (Ross et al., 1985; Harris, 1995;

93 Cale, 2000). Advocates claim that fitness testing in schools promotes healthy
94 lifestyles and physical activity, motivates young people to maintain or enhance
95 their physical fitness or physical activity levels, facilitates goal setting, self-
96 monitoring and self-testing skills, promotes positive attitudes, and enhances
97 cognitive and affective learning (Whitehead, Pemberton & Corbin, 1990; Pate,
98 1994). Other reported purposes of testing include programme evaluation, tracking
99 of fitness over time, identification of children at risk or in need of improvement
100 and/or with potential, and screening and diagnosis of fitness needs for individual
101 exercise prescription and improvement (Whitehead, Pemberton & Corbin, 1990;
102 Pate, 1994; Freedson, Curteon & Heath, 2000).

103

104 Despite its popularity and proposed purposes, controversy has surrounded fitness
105 testing of young people for a number of years and various issues have been
106 debated and concerns expressed over the use of fitness tests with this group (see
107 for example, Armstrong, 1989; ACSM, 1988; Physical Education Association
108 (PEA), 1988; Safrit, 1990; Rowland, 1995; Cale & Harris, 1998; Freedson, Cureton
109 & Heath, 2000; Keating, 2003; Cale & Harris, 2005). Issues debated most
110 commonly and consistently relate to concerns with respect to the type, validity, and
111 reliability of fitness tests and to the ethics and value or purpose of testing.

112

113 Given that so many authors and organizations have expressed concerns over the
114 use of fitness testing with young people, this raises questions as to whether fitness
115 tests do actually serve the purposes for which they are intended, and in particular,

116 whether they promote healthy lifestyles and physical activity, motivate young
117 people, and develop the knowledge and skills that are important to the sustained
118 engagement in an active lifestyle. Keating (2003) claims that unless youth fitness
119 testing actually improves fitness and increases involvement in physical activity, the
120 need for it is questionable. This paper draws on selected findings of a recent
121 'fitness testing children feasibility study' to explore the key facts, issues, concerns
122 and debates regarding fitness testing, as they relate to encouraging participation in
123 a physically active lifestyle. Based on the evidence from the literature and
124 supported by the views, experiences and observations of identified 'stakeholders'
125 and 'experts' in the field, the paper considers whether fitness testing in PE
126 represents a worthwhile or a misdirected effort in the promotion of healthy lifestyles
127 and physical activity.

128

129 **Fitness testing children feasibility study**

130 The aim of the feasibility study was to determine whether there was a need and
131 whether it would be cost effective and practical to carry out a research project
132 investigating the fitness levels of Welsh children. The study was commissioned by
133 the National Assembly for Wales and was carried out over a six month period. The
134 methodology involved two main parts: a comprehensive review of relevant
135 literature to establish the key findings and issues, and consultation with key
136 'stakeholders' and 'experts' to ascertain their views, understanding and
137 experiences of fitness testing children.

138

139 The specification for the study identified key stakeholders to comprise
140 representatives from universities in Wales and England, the PE advisory/inspection
141 service, schools (primary and secondary teachers), physical activity/health
142 promotion, the Sports Council for Wales, and the Welsh Assembly. These were
143 taken to be individuals with some working knowledge, experience and/or authority
144 with regards to physical activity promotion and fitness testing policy and/or
145 practice. Experts were taken to be individuals who, as evidenced from their
146 biographies, were highly research active and of international recognition in the
147 fields of pediatric exercise and/or health/physical activity promotion.

148

149 The literature search was carried out using metalib (a multi-database
150 research tool) and focused on the following combinations of key terms: young
151 people (and children, youth, adolescents) with physical activity, physical
152 fitness, and health; young people (and children, youth, adolescents) with
153 physical activity status and physical fitness status; young people (and
154 children, youth, adolescents) with monitoring physical fitness; the role/place
155 of fitness testing with schools; and the role/place of fitness testing with
156 physical activity and fitness promotion. Multiple searches were conducted in
157 which the above terms were cross referenced until 'saturation' point was
158 reached (i.e. the point at which the searches revealed no new literature). The
159 key findings from 1985 onwards with respect to the above areas were
160 summarised.

161

162 Consultation with the key 'stakeholders' and 'experts' was via questionnaire and
163 interview. A detailed questionnaire, informed by the findings of the literature
164 review, was designed to elicit information regarding key stakeholders'/experts'
165 knowledge, understanding, experiences, attitudes and views about the fitness
166 testing of children. The questionnaire comprised three sections and included a mix
167 of closed and open ended questions. The first section sought background
168 information on the respondents' interests, experiences and involvement in fitness
169 testing of children, as well as their awareness of studies of fitness testing on
170 children. Section two sought the respondents' views on fitness testing of children
171 generally, including the perceived benefits, pitfalls, and the role of fitness testing in
172 promoting children's health, fitness and activity, whilst the final section focused on
173 their views on the introduction of fitness testing of children in Wales and on fitness
174 testing in the PE curriculum.

175

176 The questionnaire was sent to 35 individuals, 28 stakeholders and 7 experts,
177 who were predominantly determined from the specification for the study. A
178 covering letter explained the purpose of the study, requested their involvement,
179 and for completed questionnaires to be returned by a specified date.

180

181 Following administration of the questionnaire, a semi-structured interview
182 schedule was devised with the questions being derived from the findings of the
183 literature review and the preliminary data. The primary purpose of the follow-up
184 interviews was to clarify, substantiate and enhance the questionnaire data.

185

186 Due to limited availability and the time constraints of the study, only a small
187 number of individuals were able to participate in a follow-up interview. Six
188 individuals were selected based on a preliminary analysis of the questionnaire
189 findings. In order to gain a representative reflection of the stakeholders'/experts'
190 views, two individuals who were generally for, one who was generally against,
191 and three who were undecided or neutral about fitness testing children were
192 chosen. This selection reflected the mix of questionnaire responses that were
193 received. The sample included two experts: a head of a university department
194 and a senior university lecturer, and 4 stakeholders: a local authority inspector,
195 a local authority adviser, a PE and School Sport (PESS) consultant, and a
196 teacher. The interviews followed a semi-structured format, lasted for
197 approximately one hour, and took place in the workplaces of the individuals
198 concerned. Permission was obtained to record the interviews and each was
199 transcribed verbatim as soon as possible afterwards by the interviewer. All
200 protocols associated with the methodology were in line with the authors'
201 institutional ethical guidelines.

202

203 Following data collection, the questionnaires were analysed by quantifying the
204 responses to the closed question items and identifying the common issues and
205 themes reported in the open ended questions. The interview data were analysed
206 by the identification of the common themes and consistent issues emerging from
207 the transcripts.

208

209 A substantial amount of literature and data were generated by the study, the full
210 details and findings of which are presented in the final report (Harris, Cale &
211 Bromell, 2004). However, for the purposes here, only those aspects which relate
212 to fitness testing in schools and the role of testing in the promotion of healthy
213 lifestyles and physical activity are incorporated to inform the debate and highlight
214 and exemplify key points. The literature serves as the evidence for the debate
215 whilst the findings from the stakeholders and experts are used to reinforce,
216 substantiate and illustrate key points and examples in practice.

217

218 **Faith in the tests and the data?**

219 Fitness tests are plagued by severe limitations and the appropriateness, validity,
220 and reliability of some fitness tests and fitness test batteries for use with children
221 have been questioned by a number of researchers (see for example, Safrit, 1990;
222 Rowland, 1995; Freedson, Cureton & Heath, 2000; Rice & Howell, 2000).

223

224 Whilst fitness tests claim to encourage safe healthy practice and the development
225 of and maintenance of good fitness behaviours, paradoxically the tests or batteries
226 themselves do not always reflect this behaviour. On this issue, it is argued that
227 some involve children performing tests or exercises which not only violate healthy
228 behaviour (Safrit, 1990) but common sense (Cale & Harris, 2002). Examples
229 include exercising to exhaustion as in the Multistage Fitness test (commonly
230 referred to as the 'bleep test') or executing as many sit ups as possible in one
231 minute. The appropriateness of some tests, such as the Multistage Fitness test is

232 questionable for children, the primary reason being that they have been developed
233 for use with elite, adult populations and are often applied to young people with little
234 consideration of the differences between children and adults' physiological and
235 psychological responses to exercise (see Bar-Or, 1993). Further, the suitability of
236 the test to accurately predict children's aerobic fitness has been questioned
237 (Winsley, 2003). Winsley (2003) found that the test significantly underestimated
238 children's peak VO₂ when adult equations were used. When child specific
239 equations were adopted the degree of error was reduced. Given this, he
240 recommends that if schools wish to employ the test it is crucial that child specific
241 equations are used, rather than the adult specific equations supplied with the
242 commercially available product. Risks associated with using the Multistage Fitness
243 test with young people have been also been identified and safety advice has been
244 given on how to reduce risks with the test (Eve & Williams, 2000).

245

246 Despite the above, the Multistage Fitness test has been found to be one of the two
247 most commonly employed fitness tests in schools in the UK (Harris, 1995). If its
248 popularity continues, then other and possibly more favourable options for using the
249 test would be to use it as a sub-maximal test, using heart rate elicited at different
250 levels of the test as the indicator of fitness, or as a 'novel' educational tool. For
251 example, Mullineaux (2001) suggests the test could be used as a warm up or cool
252 down, as an interval training tool, for steady paced running, and to encourage
253 teamwork and co-operation.

254

255 Concerns with the test go beyond those expressed in the literature. Based on their
256 experiences, some of the stakeholders involved in the feasibility study made some
257 strong and at times emotive comments concerning the inappropriate or misuse of
258 the 'bleep test'. A PESS consultant's experience of the test was described as
259 follows during the interviews:

260 *'the bleep test is a classic of mis-use really, you know, children just running*
261 *up and down till they fall over, what's the use of that?'*

262

263 Risk of injury was also identified as a concern by a university lecturer who had
264 been alarmed that his son had to perform this test in bare feet which, as he
265 explained:

266 *'...not only invalidates the test...but also puts him at risk of an injury, things*
267 *that like concern me'.*

268

269 In addition, the relevance and appropriateness of the mile run, another commonly
270 employed fitness test in schools (Harris, 1995), and other tests for children have
271 been queried (Hopple & Graham, 1995). Following reports from children that they
272 did not enjoy taking the mile run, Hopple and Graham (1995, p. 416) remind us
273 that children are not miniature adults and claim that current tests 'which were
274 designed by adults do not seem to mesh with children's perceptions of the world...'
275 Such issues have led some to conclude that tests suitable for use in the school
276 environment and which provide valid and objective measures of fitness are simply
277 not available (Armstrong, 1989; Armstrong & Welsman, 1997).

278

279 Further, the practice of applying norm and/or criterion referenced standards in
280 fitness testing is known to have limitations. For example, norm tables do not
281 indicate desired levels of physical fitness, provide any diagnostic feedback about
282 whether fitness is adequate, and they imply that 'more is better' (Cureton, 1994).
283 Equally, Freedson, Cureton and Health (2000) identify three main limitations of
284 criterion referenced standards. They report how the setting of the standards is
285 somewhat subjective, youth may be misclassified, and because the standards
286 represent desired minimum levels of fitness, they do not offer adequate incentive
287 for maximal achievement or improvement.

288

289 The methodological limitations associated with testing were also appreciated by
290 both stakeholders and experts in the feasibility study, with problems relating to the
291 validity and reliability of tests being the second most commonly stated pitfall in the
292 survey. Typical responses from the questionnaire data concerning such limitations
293 included:

- 294 • Limited validity and reliability of tests; tests fraught with validity, reliability
295 difficulties
- 296 • Limited reliability of data, especially with young children; inconsistency and
297 lack of standardisation of testing procedures
- 298 • Norms lead to difficulties comparing children, and there is no scientific
299 consensus on criterion-referenced ranges.

300

301 Example comments highlighting some of the difficulties included:

302 *'...The extrapolation of field test data is fraught with problems'. (expert)*

303

304 *'Even in a well-equipped sports science laboratory using 'scientific' tests,*
305 *one might consider the error to be around 10%. In the field situation using*
306 *simpler methods (e.g. sit-up tests or shuttle runs), the error is likely to be*
307 *huge'. (university lecturer)*

308

309 Another university lecturer who was interviewed expressed particular concern over
310 the limited validity and reliability of fitness test data collected in schools:

311 *'...there seems to be a lot of ad hoc fitness testing going on...I think that a*
312 *lot of this...is being conducted badly, in uncontrolled environments...'*

313

314 The above limitations are perhaps better appreciated when one considers the
315 many factors that influence fitness test performance. Factors such as the
316 environment/test conditions, lifestyle (exercise/nutrition), motivation, intellectual
317 and mechanical skill at taking the test, test practice, and in particular heredity or
318 genetic potential and maturation all affect fitness performance and will be reflected
319 in fitness test scores (Docherty & Bell, 1990; Pangrazi, 2000). The relative
320 contribution of these factors varies from test to test, and between testing sessions,
321 though heredity or genetic potential and maturation are considered to most
322 strongly influence test results (Pangrazi & Corbin, 1990; Bouchard et al., 1992). In
323 articles on the assessment of health-related fitness in schools and health-related
324 physical activity in the National Curriculum, Armstrong, (1995) and Armstrong and

325 Biddle (1992) respectively recognize the importance of both maturation and
326 motivation to test scores, claiming that fitness tests simply determine the obvious,
327 at best only distinguishing the mature and/or motivated from the immature and/or
328 unmotivated. The influence of maturation on fitness was also recognized as a
329 limitation by some of the stakeholders in the feasibility study. Within the survey,
330 one university lecturer reported how:

331 *'The biological changes with growth and development are of considerably*
332 *more impact than the biological changes caused by training...'*

333

334 Similarly, during the interviews a PESS consultant aired the following concern
335 about testing children's fitness:

336 *'...my understanding is that pre-puberty, you know, its very difficult to get*
337 *any true measurement of children's fitness anyway...until children actually*
338 *reach maturation I don't think, so I was led to believe from dim and distant*
339 *reading, that they don't actually mean a lot do they?'*

340

341 **Misinterpretation of the data?**

342 Despite the limitations, it is still often assumed that fitness in young people is
343 primarily a reflection of the amount of activity performed, and that those who score
344 high on fitness tests are active and those who do not are inactive (Pangrazi, 2000).
345 Cale and Harris (2005) however, note how this assumption is inaccurate. The
346 evidence suggests that the relationship between physical fitness and physical
347 activity is low among children (Armstrong & Welsman, 1997) and a child's activity

348 level cannot be judged from his or her fitness level (Corbin, 2002). Armstrong and
349 Welsman (1997) explain that the lack of relationship between physical activity and
350 fitness probably lies in the low level of physical activity of most young people. In
351 addition, the two are distinct in that physical activity is a behaviour (process) and
352 fitness is a parameter (product). Physical activity is an important variable in fitness
353 development for adults, but for children and youth, other factors are of equal or
354 greater importance (Pangrazi, 2000). In terms of promoting physical activity to
355 young people, Cale and Harris (2005) warn how problems can arise if fitness test
356 scores are linked to activity levels. On the one hand, an active child who scores
357 poorly on a test may become disappointed, disillusioned, demotivated and 'turned
358 off' activity because he/she feels it does not 'pay off' (Corbin, 2002), whilst an
359 inactive child who scores well may be delighted with the outcome, conclude that
360 everything is alright when it is not, and consequently may not be motivated to
361 change.

362

363 The importance, but difficulty of conveying the correct or right messages to
364 children concerning their fitness scores was raised by several individuals in the
365 feasibility study. On this issue, one teacher reported that testing 'could be divisive',
366 whilst during the interviews, an adviser expressed concern about how children
367 might respond to low fitness scores:

368 *'I guess you're going to get, as in all instances really, perhaps, quite a large*
369 *variation in the way in which children are going to respond to that sort of*
370 *information.'*

371

372 **Impact of fitness testing?**

373 As noted earlier, advocates of fitness testing in schools argue that testing
374 motivates young people, enhances learning and promotes positive attitudes which
375 would seem to be compelling from the viewpoint of physical activity promotion
376 (Seefeldt & Vogel, 1989; Cale & Harris, 2002). Yet, when debating the role or
377 value of fitness testing, researchers have expressed concern that fitness testing
378 may, to the contrary, be repetitive and boring (Keating, 2003), de-motivating and
379 counterproductive to the promotion of active lifestyles in young people (Corbin,
380 Pangrazi & Welk, 1995; Rowland, 1995). Rowland (1995) argues that fitness tests
381 are anti-ethical to the goal of promoting physical activity in so far as they can be
382 demeaning, embarrassing and uncomfortable for children (often those about which
383 there is most concern), and may reinforce the notion that exercise is competitive
384 and unpleasant. Keating (2003) warns of problems relating to lack of privacy with
385 testing and test results, whilst Corbin, Pangrazi and Welk (1995) caution that
386 testing that is done improperly may turn many youngsters 'off' rather than 'on' to
387 activity and should therefore be discontinued.

388

389 Whilst a good deal of research has been conducted on measurement issues and
390 the reliability and validity of fitness tests over the years, research has largely
391 ignored the effects of youth fitness testing in schools (Keating, 2003). Relatively
392 little attention has been paid to the motivational effects of fitness testing (Fox &
393 Biddle, 1988; Jackson, 2000) or fitness test awards on young people (Keating,

394 2003), or on young people's perspectives of, or knowledge and/or attitudes
395 towards tests (Fox & Biddle, 1988; Jackson, 2000). The need for research of this
396 nature is recognized by Pate (1991, p. 233) who suggests:

397 *'It would be desirable to know how children respond to participation in these*
398 *(physical fitness) tests. Are tests viewed as fun? Do tests have differential*
399 *effects on different types of children?'*

400

401 Studies that have been conducted on the motivational effects of testing (Luke &
402 Sinclair, 1991; Whitehead & Corbin, 1991; Goudas, Biddle & Fox, 1994; Adams,
403 1996) have revealed variable results and it has been concluded that
404 motivational enhancement from testing cannot be taken for granted (Goudas,
405 Biddle & Fox, 1994) and that there is no empirical data to indicate that students
406 value fitness test awards (Keating, 2003). Attitudes towards fitness tests have
407 been found to be unfavourable (Luke & Sinclair, 1991) and some youngsters
408 (and teachers) have been accused of not taking testing seriously (Keating,
409 2003). The motivation of young people towards testing has been found to be
410 influenced by feedback following tests, perceived competence (Whitehead &
411 Corbin, 1991) or perceived success, and achievement goal orientation and
412 performance in the tests (Goudas, Biddle & Fox, 1994). Likewise, the PEA has
413 also noted that there is no hard evidence that fitness tests motivate individuals
414 and suggest that in parallel areas of education there is supportive evidence that
415 tests only motivate those who do well (PEA, 1988).

416

417 Concerning knowledge and attitudes, Hopple and Graham (1995) investigated
418 what children 'thought, felt and knew about' the mile run test. They revealed that
419 children generally showed little or no understanding of why they were being asked
420 to complete the test and many disliked taking it, viewing it as a painful, negative
421 experience to be either actively or passively 'dodged.' It would therefore seem that
422 from the evidence available, albeit limited, the motivational and/or educational role
423 of fitness testing in schools is questionable, certainly for a number of youngsters.

424
425 Despite the limited evidence from the literature, the motivational and particularly
426 the educational role of fitness testing came through as justifications for testing in
427 the findings of the feasibility study. Responses from the questionnaire survey data
428 from one expert and a number of stakeholders relating to motivation included:

- 429 • Can be motivational if health-related, linked to physical activity, and
430 used/taught in the right way
- 431 • Can motivate some children into 'beating' their previous test scores
- 432 • Can be used as a lever to stimulate interest in exercise.

433

434 With regards to the educational role of fitness testing, typical responses, this time
435 from one expert and a few stakeholders included:

- 436 • To educate pupils with regard to the different components of fitness
- 437 • To aid learning and support children in maintaining a fit and healthy lifestyle
- 438 • Can be educational as part of understanding the various ways in which the
439 body moves

- 440 • To inform pupils about their own relative fitness levels and enable pupils to
441 make informed decisions
- 442 • Gives children knowledge of their strengths and limitations of their own
443 bodies
- 444 • To help older pupils learn how to improve their personal fitness.

445

446 There was also generally agreement amongst those interviewed that fitness
447 testing could educate children about health, activity and fitness, their own
448 fitness, and help them to set specific targets. A university lecturer, whilst
449 describing fitness testing in schools as ‘highly unsophisticated’, noted that it had
450 a purpose in helping children to ‘have a good understanding about their own
451 body, their own fitness and the things that govern that.’ In addition, a PESS
452 consultant considered that fitness testing might ‘encourage children to take
453 more responsibility for their own actions, their own choices...’

454

455 In addition though, concerns were commonly reported by stakeholders and experts
456 with respect to the motivational and educational role of testing. They warned how
457 tests could de-motivate, cause discomfort, stress, label and embarrass children
458 and make them look ‘daft’ in front of their peers. They also noted how some
459 children may hate testing, perceive it as threatening (especially if results are made
460 public and children lack confidence), fear failure and therefore be ‘turned’ or
461 ‘switched off’.

462

463 Based on her experiences, one PESS co-ordinator had the following to say:

464 *'PE teachers who use fitness tests regularly on any and every group of children*
465 *should be encouraged to stop! Children often hate and dread them, they don't*
466 *tell us very much, and why should children be forced to endure them?'*

467

468 A university lecturer also expressed concern over the effects of overexposure of
469 children to some tests explaining:

470 *'...the tests tend to be driven by the motivation of the child, and I think the*
471 *more they do it the more de-motivated some of them are becoming...'*

472

473 Whilst acknowledging that fitness testing could possibly be used as a 'fun' activity
474 for pupils to 'have a go', a PESS consultant commented that 'you would need to
475 know your pupils well to determine whether it would be fun or scary'. However,
476 she and others were of the view that other forms of activity including game-like
477 activities and exercise experiences such as walking, dancing, aerobics, boxercise,
478 circuits with a 'fun' element were more appropriate for promoting activity. In
479 conclusion, it was proposed that fitness testing should only be adopted if it was
480 meaningful, relevant and had 'a direct and positive influence on motivating
481 teachers/pupils to develop active lifestyles'.

482

483 **Misdirected interest and confusion?**

484 One of the reasons why physical fitness testing may have assumed such popularity
485 in schools in recent years relates to the widespread and growing concerns over

486 young people's physical fitness and the implications of this for their current and
487 future health. However, efforts to advocate fitness testing on these grounds are
488 considered misguided. According to Cale and Harris (2005), much media attention
489 and 'hype' has been afforded to young people's fitness, with messages leading us
490 to believe that all, or at least most of today's youth are unfit, unhealthy, and far less
491 than fit than in previous decades. On this issue, Corbin (2002, p. 139) suggests
492 that the media 'likes bad news' and that 'much talk about lack of fitness of our youth
493 is hyperbole, designed to create a need for physical education in the eyes of the
494 public.' Following a comprehensive literature review of young people and physical
495 fitness, Cale and Harris (2005) summarise their findings as follows: 'there is no
496 evidence to suggest that low levels of aerobic fitness are common amongst young
497 people' and 'no convincing evidence to suggest that young people's aerobic fitness
498 has declined over time' (p. 32).

499

500 Alarmed by reports to the contrary, PE teachers and others may feel compelled and
501 even duty bound to respond by focusing on and measuring young people's physical
502 fitness (Cale & Harris, 2005). A university lecturer who was surveyed held similar
503 views reporting how:

504 *'Fitness testing is something that at first glance is appealing to the public*
505 *and politicians and seems to be a simple step towards improving health.*
506 *But once consideration is given to the issue...then the problems become*
507 *clear'.*

508

509 During the interviews a PESS consultant stated:

510 *'what I would hate to happen, as will very often happen....they would think,*
511 *oh yes, OK then, I gotta make my children run, I gotta, you know,without*
512 *the educational component in there. That is my concern, and I think that*
513 *teachers will very often latch on to something that they think they are doing*
514 *because its right, and sometimes for the wrong reasons...'*

515

516 The implications of children's fitness and fitness test scores to their health are not
517 well established and conclusions are equivocal. In addition, there is no evidence
518 that children's health and/or fitness, or the monitoring of either, influences their
519 participation. With regards to the former point, studies which have been conducted
520 have largely focused on associations between children's cardiorespiratory fitness
521 and cardiovascular disease (CV) risk factors (Boreham & Riddoch, 2001). Some
522 claim there is only weak evidence that physical fitness is related to health in young
523 people (Twisk, 2000) and little or no direct evidence that physical fitness during
524 childhood and adolescence is related to adult health (Twisk, 2000; Thomas, Baker,
525 & Davies, 2003). More recently however, two large-scale studies, the European
526 Youth Heart Study and the Amsterdam Growth and Health Longitudinal Study, have
527 reported associations between physical fitness and CVD risk factors in children and
528 adolescents (Wedderkopp et al., 2003; Andersen et al., 2003), between physical
529 fitness in adolescence and adulthood respectively (Twisk, Kemper & van Mechelen,
530 2002), and a clustering of risk factors in children and adolescents with low fitness
531 (Wedderkopp et al., 2003; Andersen et al., 2003). Consequently, it seems that the

532 role of at least cardiorespiratory fitness in enhancing health should certainly not be
533 dismissed, but further studies are required (Boreham & Riddoch, 2001).

534

535 Perhaps not surprisingly given media messages and the limited research evidence,
536 there was confusion amongst some of the stakeholders in the feasibility study with
537 respect to children's fitness status, as well as with the concepts of health, fitness
538 and activity and the relationships between them. Indeed, the terms were
539 sometimes used interchangeably as though they were synonymous.

540

541 One PE Adviser who was in favour of fitness testing children expressed concern
542 that children usually overestimate their capabilities and are not fully 'aware of their
543 low levels of fitness'.

544

545 Some held the view that fitness testing would impact on children's fitness, with one
546 inspector/adviser claiming also that 'a better physical health status for children'
547 should come out of fitness testing. Furthermore, it was suggested by another
548 adviser that:

549 *'in terms of the health of our nation, we really do need to look at the fitness*
550 *of our youngsters very, very seriously...'*

551

552 whilst a PE teacher considered fitness testing to be very important in order 'to gain
553 evidence and facts about children's health'.

554

555 One adviser/inspector also suggested that it was important to:

556 *'address this critical issue of (children's) health and fitness status, otherwise*
557 *we could have the most knowledgeable and articulate spectators in the*
558 *world who have poor health and lack participation'.*

559

560 Some stakeholders however, demonstrated a broader understanding of the
561 concepts and issues. One PESS co-ordinator reported:

562 *'Health isn't really about fitness',* and went onto explain:

563

564 *'and I think it would give the wrong message if we promoted health as being*
565 *'fit'. This would put a lot of people off trying to be healthy if they thought*
566 *they'd have to have a high fitness level to be healthy'.*

567

568 Similarly another PESS consultant did not see the connection between fitness
569 testing and the promotion of physical activity/health and thought that instead, the
570 latter should be promoted by giving children exercise experiences which would
571 *'enthuse and inspire them to continue with exercise in their own time'.* She was
572 concerned that fitness testing might turn children off health-based type physical
573 activities.

574

575 **Misdirected focus or too narrow an approach?**

576 As noted earlier, advocating fitness testing on the grounds that children are unfit
577 and/or that their fitness (or the monitoring of their fitness) will strongly influence

578 their current or future health (fitness) or participation is misguided. Given though,
579 that a sizeable proportion of young people have been reported to be inactive and
580 to lead sedentary lifestyles (Armstrong & Welsman, 1997; Armstrong & Van
581 Mechelen, 1998) there would seem to be a need to focus attention on influencing
582 young people's physical activity behaviour (Cale & Harris, 2005). In other words,
583 to place emphasis on the 'process' of physical activity rather than on the 'product'
584 of fitness.

585

586 Yet, there is concern that fitness testing could lead to more attention being given to
587 the product and product-related issues, namely 'fitness' and 'performance' within a
588 PE programme, than to the process and process-oriented issues of 'health' and
589 'physical activity' behaviour (Harris & Cale, 1997; Cale & Harris, 2002). Other
590 good reasons have also been given for trying to influence physical activity rather
591 than physical fitness (Rowland, 1995; Pangrazi, 2000; Cale & Harris, 2002; Corbin,
592 2002). For example, Corbin (2002) argues that the idea that physical fitness is a
593 paramount goal for children is a misconception and reminds us that an over
594 emphasis on fitness can have as many negative consequences as positive ones.
595 It is also claimed that the focus on raising fitness levels which was common
596 practice for many years, has been unsuccessful (Pangrazi, 2000). In contrast
597 increased physical activity, which is relatively free from genetic and maturational
598 influences, is an outcome that can be accomplished by all children regardless of
599 ability (or disability) or personal interests, and will further benefit those young
600 people who need it most (Pangrazi, 2000). Likewise, Rowland (1995) suggests

601 that a shift to promoting physical activity is more likely to be acceptable to the
602 general public, particularly to those who are sedentary or have low fitness levels.
603 He views the routine field testing of children as 'archaic' (p. 125) and claims that a
604 shift from a fitness to a physical activity promotion model would serve as the best
605 argument for abandoning the practice.

606

607 Individuals surveyed in the feasibility study also appeared to endorse this view.

608 For example, one expert noted how:

609 *'...fitness testing will set us back years and deflect us from the key issue –*
610 *more activity'.*

611

612 One health professional was of the view that the issue of 'healthy' lifestyles,
613 including nutrition and physical activity was the most important priority, whilst a
614 university lecturer who considered that fitness testing played no role in promoting
615 activity reported:

616 *'The concepts of physical activity...and the fitness effects activities produce*
617 *(e.g. aerobic, flexibility, strength, etc) can be better achieved by analysing*
618 *the activity, not the change in fitness an activity might produce'.*

619

620 This individual further reinforced the point during interview:

621 *'...I think that activity data is critically important, you need to know what*
622 *activity people are doing, of what type, and what activity they are not*
623 *doing...'*

624

625 From a theoretical perspective, another argument against focusing on fitness and
626 fitness testing is that it provides a narrow framework for the promotion of physical
627 activity. Fitness testing represents an individualistic approach to physical activity
628 promotion which targets change in the individual. The limitations with this
629 approach are that it tends to hold individuals responsible for their health or
630 behaviour (and consequently their fitness), assumes they have control and the
631 capacity to make decisions, and fails to acknowledge the influence of other factors
632 in the physical and social environment. However, as previously noted, we know
633 that fitness is largely influenced by hereditary or genetic potential and maturational
634 factors. Further, young people in particular often have little control over, or
635 decision making opportunities with respect to their lifestyles and behaviours and
636 other factors are arguably more influential.

637

638 This individualistic perspective is also illustrated within the discourse used by some
639 of the stakeholders in the feasibility study. Comments within both the
640 questionnaires and interviews included references to encouraging children to take
641 'more responsibility for their own actions' or 'individual responsibility' for monitoring
642 their progress, showing children 'how they could shape exercise habits' and
643 allowing them to 'make sensible decisions'. An adviser/inspector surveyed
644 reported a pitfall of fitness testing to be the need to take:

645 *'into context the sociological issues relating to healthy and active lifestyles'.*

646

647 As a result of the limitations of an individualistic approach, environmental or
648 ecological approaches to the promotion of physical activity have attracted growing
649 interest and support more recently (Sallis, Bauman & Pratt, 1998; Spence & Lee,
650 2003). Such approaches have, at their core, the notion that behaviour is
651 influenced by multiple facets of the intrapersonal (e.g. psychological and biological
652 variables, developmental history), interpersonal (e.g. family, peers), and physical
653 and policy and legislative environments (Gorely, 2005). In line with this, and with
654 reference to the broad and multi-dimensional correlates of childhood physical
655 activity, Welk (1999) proposes a conceptual model of physical activity promotion
656 for children that adopts a social-ecological framework and which acknowledges the
657 input and interaction of various personal, social, and environmental influences on
658 children's physical activity.

659

660 To date, the promotion of physical activity in schools has primarily been limited to
661 individualistic efforts made within the curriculum with little attention paid to the
662 effects of environmental factors on youth (Richter et al., 2000; Wechsler et al.,
663 2000). Fitness testing represents another 'curriculum effort' and, from the
664 evidence so far presented, it seems a narrow and not especially effective one at
665 that. It could even be argued that such efforts and an individualistic approach are
666 being reinforced within both the National Curriculum for Physical Education
667 (NCPE) and examination PE with their emphasis on 'fitness' and 'personalised'
668 exercise programmes. 'Knowledge and understanding of fitness and health' is one
669 of the four aspects of the NCPE whilst planning a personalized exercise

670 programme is a feature of the NCPE at Key Stage 4 and a common feature of
671 examination syllabi.

672

673 Of course, a similar criticism could be leveled at a physical activity focus in the
674 curriculum, in that typically individualistic approaches are also relied upon. For
675 example, PE teachers encourage young people to make healthy choices regarding
676 their physical activity behaviour by delivering persuasive arguments for and
677 relevant information about physical activity, and possibly involving them in learning
678 goal setting, programme planning, self-monitoring or time management skills to
679 encourage and facilitate their participation. The key difference however, is the
680 potential this focus affords for teachers to also work within an ecological framework
681 and to explore with young people the range of influences on their physical activity
682 (e.g. peers, family, home, curriculum and school environment), the barriers they
683 face, and possible strategies or measures to overcome these within and beyond
684 the curriculum and school. Further and arguably, a combination of approaches
685 and skills are considered important and relevant to encouraging and facilitating an
686 active lifestyle.

687

688 Cale and Harris (2006) note how, from an ecological perspective, many aspects of
689 the school (and wider environment) can either promote or inhibit the adoption of an
690 active lifestyle. To increase the likelihood of positively influencing young people's
691 physical activity an ecological framework which would address the multiple levels
692 of influence on physical activity and explore the potential of every aspect of the

693 school to promote physical activity would seem to be the way forward. This would
694 involve consideration of not only the PE curriculum, but how out-of-school hours
695 learning opportunities, the school environment (e.g. facilities, playing fields,
696 playground, equipment), school ethos (e.g. rewards, recognition), policies (e.g.
697 changing, kit, transport), and community links were conducive to, and could serve
698 to promote physical activity to all pupils.

699

700 **Inappropriate implementation of tests and use of test data?**

701 Concerns have also been expressed over the way in which fitness tests are often
702 implemented and conducted within the curriculum, which are also likely to militate
703 against efforts to promote physical activity. Corbin, Pangrazi and Welk (1995, p.
704 348) ask, 'is it the testing itself that is 'bad' or the way in which it is done?'

705

706 Pate (1989) expresses concern that too often tests have been an almost irrelevant
707 adjunct to the curriculum or else often dominate or even constitute the entire
708 fitness education programme. The amount of curriculum time spent on fitness
709 testing without necessarily positively influencing young people's activity levels or
710 their attitudes towards physical activity has been criticized (Harris & Cale, 1997;
711 Cale & Harris, 2002), which would seem to suggest that such PE time could be
712 used more wisely (Cale & Harris, 2005). According to Harris (2000), the time spent
713 on performing and scoring fitness tests may detract from promoting the process of
714 being active and may be at the expense of time spent on more useful activity

715 promoting activities, including developing knowledge and understanding about
716 physical fitness and what physical fitness tests measure.

717

718 Concerns over the implementation of tests were also evident within the feasibility
719 study. It was noted how 'fitness testing lessons can be bland and not very active'
720 and how children may come to 'associate PE lessons with testing rather than being
721 active and appreciating the value and benefits of exercise'. An interviewee, a
722 PESS consultant, appeared to hold similar views commenting:

723 *'I'm not against knowing where we are with regard to our children's fitness*
724 *but I am against how it could possibly be done, and I'd hate it to be mis-*
725 *used along the way'.*

726

727 Individuals surveyed were also critical of the time spent on testing and/or of fitness
728 testing dominating programmes. One expert stated:

729 *'Fitness testing in schools is of little value and curricular time could and*
730 *should be better spent...'*

731

732 whilst a teacher acknowledged how:

733 *'we must incorporate testing within a quality scheme of work, not testing for*
734 *testing's sake'.*

735

736 One expert speaking of his aspirations for and views concerning the future of
737 fitness testing reported how tests should be:

738 *'...a personal, educational and development tool – no more'.*

739

740 Finally, the way in which fitness test results are used is important. Fitness test
741 scores may be put to a number of uses, some of which may be considered
742 inappropriate, undesirable and counterproductive to the promotion of physical
743 activity. Examples of inappropriate uses of tests include: to grade pupils as a
744 primary indicator of achievement in PE, to evaluate teacher competence, or to use
745 them as a measure of the success of an institution or programme (Corbin,
746 Pangrazi & Welk, 1995; Corbin 2002). Corbin (2002) however, challenges
747 employing fitness tests for such purposes and is highly critical of schools that use
748 fitness tests scores in this way, suggesting they obviously and mistakenly
749 subscribe to the idea that fitness is the paramount goal of PE. Further, he warns
750 that this could have the following potential negative consequences:

- 751 • loss of interest in PE and physical activity
- 752 • teaching to the test
- 753 • student and teacher cheating on fitness tests
- 754 • undermining the confidence of students who find that, even with effort, they
755 cannot achieve the fitness goals necessary to get good grades or to meet
756 teacher expectations (Corbin, 2002, p. 134 & 135).

757

758 Some of these consequences may seem extreme, but are nonetheless
759 legitimate if tests scores are, as we are led to believe, commonly used for such
760 purposes (Corbin, Pangrazi & Welk, 1995; Corbin 2002). Further, and more
761 importantly, they will do little to support young people's engagement in healthy

762 active lifestyles. Armstrong and Welsman (1997) advise 'teachers must ask
763 themselves why they are testing young people's fitness, and if the answer is for
764 classification purposes, then we suggest that they would be better employed
765 seriously addressing the problem of young people's sedentary lifestyles' (p.
766 257). Several individuals in the feasibility study also expressed concern over
767 the inappropriate use of fitness test results. For example, an expert reported in
768 the survey that 'in the hands of sports coaches and many teachers, fitness
769 testing will be badly used', whilst a PESS consultant commented 'I'm afraid that
770 in the wrong hands, fitness testing of children is used inappropriately...'

771

772 **A worthwhile or misdirected effort?**

773 Given the preceding discussion, it seems that fitness testing may not always serve
774 the purposes for which it is intended. In particular, the role fitness testing plays in
775 PE in promoting healthy lifestyles and physical activity is questionable and cannot
776 be taken for granted. For example, little evidence has been found to support the
777 notion that fitness tests promote healthy lifestyles and physical activity, motivate
778 young people, and develop the knowledge and skills that are important to the
779 sustained engagement in an active lifestyle. To the contrary, without careful
780 consideration of the issues, limitations and factors influencing fitness tests and the
781 way in which tests are administered, fitness testing can be unpleasant,
782 embarrassing and meaningless for many young people, and scores can be
783 inaccurate, misleading, unfair and demotivating (Cale & Harris, 2005). In this
784 respect and, as acknowledged earlier, fitness testing is likely to be

785 counterproductive (Docherty & Bell, 1990; Corbin, Pangrazi & Welk, 1995;
786 Rowland, 1995). Keating (2003) claims that in the United States (US) three facts
787 cast doubt on the role of fitness testing in promoting physical activity (and improving
788 youth fitness): a) children have failed to show improvements in fitness and have
789 become less physically active; b) the percentage of overweight youth has increased
790 substantially in recent years; and c) the proportion of inactive adults has also
791 increased dramatically.

792

793 Whilst views were mixed, some individuals in the feasibility study questioned the
794 place of fitness testing within the PE curriculum and its role in the promotion of
795 physical activity. When asked whether they thought there was a place for fitness
796 testing in the curriculum, a third of individuals reported they were unsure and a fifth
797 considered it had no place. Those against fitness testing offered the following
798 reasons:

- 799 • Misguided, backward looking step
- 800 • Fraught with validity, reliability difficulties
- 801 • Has not been effective in the past
- 802 • It serves no real purpose in terms of increasing participation or promoting
803 interest in sport.

804

805 Further, over a third of individuals responded negatively and over 40% neutrally
806 with regards to the question 'what are your views concerning the role of fitness
807 testing in the promotion of children's physical activity?'

808

809 A PESS consultant and a teacher who felt fitness testing had no role to play in
810 promoting activity argued respectively that testing wasn't necessary as 'enjoyment
811 was more important' and that physical activity could be promoted 'without having to
812 test the fitness of pupils'. In agreement, another teacher explained:

813 *'I feel physical activity can be promoted better through 'fun' game like*
814 *activities and training methods such as aerobics, step, boxercise, circuits...'*

815

816 It has also been suggested that fitness and fitness testing is limited in that it
817 represents an individualistic approach to physical activity promotion which fails to
818 acknowledge factors in the physical and social environment which influence
819 physical activity. Thus, based on the evidence from the literature, and taking
820 account of the views, understanding, experiences and observations of individuals
821 within the feasibility study as well as our own theoretical stance, we suggest that
822 much of the fitness testing conducted within PE (though certainly not necessarily
823 all) may well represent a misdirected effort in the promotion of healthy lifestyles
824 and physical activity and that PE time could therefore be better spent. Further, we
825 call for increased attention to be paid to the ecological approach to physical activity
826 promotion within schools and PE whereby all avenues for promoting physical
827 activity including the curriculum, out-of-school hours learning, the school
828 environment, ethos, policies, and community links would be considered.

829

830 If appropriately employed however, and provided all relevant factors and limitations
831 are taken into account, there is no reason why fitness testing cannot play a role in
832 supporting healthy lifestyles and physical activity and in educating young people
833 about physical activity and fitness. To achieve this though, clear guidance on the
834 appropriate use of fitness testing in young people is needed. In 1994, Pate noted
835 how, despite its popularity over a number of years, there was little scientific
836 evidence to guide us in deciding how best to incorporate fitness testing into PE.
837 Over ten years on, it seems little has changed. As already noted, most of the
838 research in this area has addressed issues of measurement, validity and reliability
839 and relatively little attention has been paid to understanding how young people
840 respond to fitness tests or how tests can best be used to attain important
841 educational and physical activity promotion objectives.

842

843 Recommendations concerning the implementation of fitness testing with young
844 people have been made by a number of researchers and professional
845 organizations (e.g., ACSM, 1988; Pate, 1994; Corbin, Pangrazi & Welk, 1995;
846 American Alliance for Health, Physical Education, Recreation and Dance
847 (AAHPERD), 1999a; 1999b; 1999c; Harris, 2000; Cale & Harris, 2005), but these
848 have been based more on common sense than on scientific evidence. The latter
849 recommendations (Cale & Harris, 2005) represent a summary and interpretation of
850 the former and teachers intent on implementing fitness testing in PE are advised to
851 consult these. In addition, it is recognized that teachers may need specific
852 guidance, support and training in the implementation of fitness testing within the

853 curriculum and in particular in how to use tests and test results to achieve
854 cognitive, affective and behavioural objectives with young people (Cale & Harris,
855 2005).

856

857 This view was also supported by the stakeholders and experts in the feasibility
858 study, with several highlighting the need for appropriate guidance and support
859 materials to assist teachers, including programmes to work from. One university
860 lecturer surveyed reported:

861 *'there is a need to convert the extensive detailed scientific knowledge about*
862 *fitness testing into appropriate educational tools so that teachers (and*
863 *coaches) can be provided with material that allows them to offer children a*
864 *contemporary understanding of the facts and issues'.*

865

866 When asked about his aspirations for the future of fitness testing, one teacher
867 reported:

868 *'I would like to see fitness development as a stand alone unit of work within*
869 *the National Curriculum; all children following a similar scheme of work...'*

870

871 One PE adviser felt confident that in fact most of the problems associated with
872 fitness testing in schools could be overcome by making it 'very specific, very
873 explicit, providing support and guidance and making it simple'.

874

875 On this, there have been very positive developments in the US with the production
876 of fitness resources for teachers such as 'Physical Best' (AAHPERD, 1999a;
877 1999b; 1999c) and 'FITNESSGRAM/ACTIVITYGRAM (The Cooper Institute, 2003;
878 www.fitnessgram.net). The resources represent comprehensive fitness education
879 programmes which recognize the importance of physical activity, as well as fitness,
880 by seeking to develop the affective, cognitive and behavioural components
881 associated with physical activity participation. The latest version of
882 FITNESSGRAM/ACTIVITYGRAM (8.0) includes fitness and activity assessments
883 and personalised reporting programmes, and the accompanying reference guide
884 provides guidance on the appropriate and inappropriate use of the resource.
885 Teachers in the UK require and would welcome an equivalent resource or
886 resources.

887

888 Finally, given the limitations of individualistic approaches outlined earlier and our
889 call for more attention to be paid to the ecological approach to physical activity
890 promotion, we suggest teachers also need specific guidance, support and training
891 in how to embrace and incorporate this approach in their efforts to promote healthy
892 lifestyles and physical activity. This will involve recognizing and helping young
893 people to recognize the range of influences on their physical activity behaviour and
894 implementing and/or proposing strategies within and beyond the curriculum and
895 school which take account of these.

896

897 **Conclusion**

898 Drawing on the findings of a recent ‘fitness testing children feasibility study’, this
899 paper has considered the role of fitness testing in PE in the promotion of healthy
900 lifestyles and physical activity. The key facts, issues concerns and debates with
901 regards to fitness testing young people have been explored, as they relate to
902 promoting a physically active lifestyle. Based on the evidence available, it is
903 suggested that much of the fitness testing carried out in PE may well represent a
904 misdirected effort in the promotion of healthy lifestyles and physical activity, and
905 that PE time could therefore be better spent. There appears to be little evidence
906 that fitness tests promote healthy lifestyles and physical activity, motivate young
907 people, and develop the knowledge, understanding and skills that are important to
908 engagement in an active lifestyle. To the contrary, there is evidence to suggest
909 that fitness testing may be counterproductive to the goal of promoting physical
910 activity for some youngsters. Given then, the limitations of fitness testing as a
911 model of physical activity promotion, along with the plea to focus more on young
912 people’s physical activity than on their physical fitness, we appeal for more
913 attention to be paid to the ecological approach to physical activity promotion within
914 schools and PE.

915

916

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