

Physical Literacy Measurement – *The Missing Piece*

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Background

Physical literacy, as a concept, is the “new kid on the block” and provides a fresh springboard from which a renewed emphasis on physical education can emerge. Many diverse definitions of physical literacy have been forwarded (Haydn-Davies, 2005; Lloyd, Colley, & Tremblay, in press; Lloyd & Tremblay, in press; Mandigo, Francis, Lodewyk, & Lopez, 2009; Maude, 2001; National Summit on Physical Education, 2005; Penney & Chandler, 2000; Sport Canada, 2008; Whitehead, 2001, 2007), and although similarities are evident in all these definitions, no agreement is evident. In fact, a recent poll found that only 17% of Canadians are even aware of the term “physical literacy” (Decima Research, 2008). The general concept and term is appealing, and when well defined and measurable, helps to better position physical education within the school-based education context. Mandigo et al. (2009) indicate, “the Ontario Ministry of Education is set to launch a new Health and PE Curriculum in 2009 that envisions a generation of physically literate students” (p. 30). If physical literacy is to become a key outcome of physical education curricula, which we firmly believe should be the case, appropriate metrics must be in place to evaluate the key domains of physical literacy. Indeed, it was widespread measurement findings that led to “an era where literacy programs have become a priority for Provincial Ministries of Education” (Mandigo et al., 2009, p. 27). In other words, in order for physical education or physical literacy to gain this type of prominence within the greater education context, it must be measured.

The purpose of this paper is to provide a rationale for the comprehensive and objective measurement of physical literacy as a means to elevate the importance of physical education, increase the robustness of physical education assessment, improve monitoring and evaluation of physical education curricula, and provide important surveillance evidence needed to assist with resource allocation by decision-makers. Our belief is that it is

necessary to increase the accountability of those teaching and overseeing physical education across Canada, a process that is long overdue. This must be done just as the accountability of those teaching literacy and numeracy has been brought to the forefront in recent years. Careful measurement will improve the standards, expectations, profile, credibility, and confidence of the profession leading to more physically literate children – which



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is of course the goal of physical education, sport, and recreation. Historically, those areas that are measured and reported (e.g., numeracy and literacy) are more prominent and receive disproportionate resources from policy makers. We propose that if physical literacy were similarly measured and reported in a standardized fashion as an outcome of physical education, more attention and resources would be allocated thereby. This elevated prominence may well be propelled by an increased perception of importance facilitated by the presence of such measurement.

Demand for testing, measurement and assessment

Assessment and evaluation are fundamental to the education and health fields and there has been demand over the years to have a conceptually appealing, universal “test” which measures the essence of physical literacy. The Canada Fitness

Award (Canada Fitness Award Manual, 1984) was used widely in Canada during the 1980s and 1990s, however the performance-related focus of the test and the “award” system disenfranchised those who were in greatest need of motivation, and it was slowly withdrawn from most physical education programs. Over the past 10-15 years, after the Canada Fitness Award program was discontinued, many stakeholder groups have repeatedly called for a “new and improved” Canada Fitness Award. In 2002, the Canadian Association of Health, Physical Education, Recreation, and Dance (CAHPERD) initiated a process to develop “a tool for the assessment of physical fitness and health levels of children” and prepared a proposal for submission to Health Canada. In 2007, CAHPERD completed a feasibility study for Sport Canada on introducing a new national program to build on the legacy of the Canada Fitness Award (CAHPERD, 2007). The results

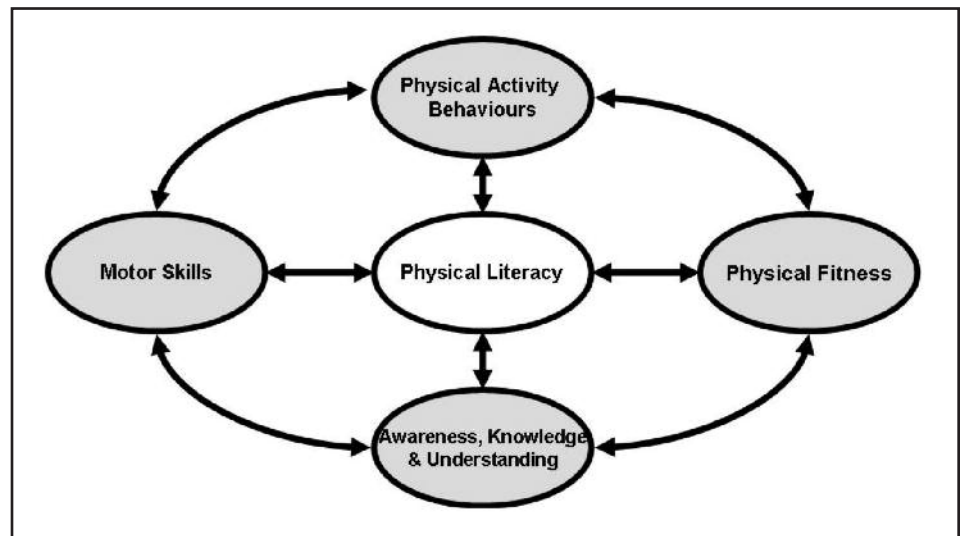
of this feasibility study (expert consensus), showed overwhelming support in their group of experts for a new measurement program. In their election platform in the fall of 2007, the incumbent Ontario Liberal Party proposed the creation of a new Ontario fitness challenge in grades 1-6 (Liberal Ontario, 2007). In 2009, the Public Health Agency of Canada, the Ontario Ministry of Health Promotion, and several other national and provincial groups provided support to assist with the development of a new test battery called the *Canadian Assessment of Physical Literacy*. Furthermore, the childhood obesity and physical inactivity crisis, as summarized each year in the Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth (see www.active-healthykids.ca), has prompted senior government officials to demand regular, quality, national monitoring and surveillance of robust physical activity, fitness,

Physical literacy is a term that is becoming more and more prominent in both physical education and sport domains. It is prominent, for example, in the new Ontario physical education curriculum (2010) and Sport Canada's Long Term Athlete Development Model (2008). This paper highlights the need to measure or assess “physical literacy” in children in order to understand the state of physical literacy in Canadian children, evaluate the effectiveness of these new programming initiatives, and identify gap areas where more resources are needed.

Le savoir-faire physique est un terme qu'on voit de plus en plus souvent dans les domaines de l'éducation physique et du sport. À titre d'exemple, il revient fréquemment dans le texte du nouveau programme-cadre en éducation physique de l'Ontario (2010) et dans le Modèle du développement à long terme de l'athlète (2008) de Sport Canada. Cet article souligne la nécessité de mesurer ou d'évaluer le « savoir-faire physique » des enfants pour faire le point sur l'état du savoir physique chez les jeunes du Canada, pour évaluer l'efficacité des nouveaux programmes fondés sur le savoir-faire physique et pour cerner les lacunes à combler à l'aide de ressources additionnelles.



Figure 1. The four domains of the Canadian Assessment of Physical Literacy (reproduced from Lloyd, Colley, Tremblay, in press; with permission)



and health indicators in children and youth, as summarized in the recent report by the Ontario Ministry of Health Promotion (2008). In sum, the call for assessment/measurement in this domain is not new and there is compelling evidence that an assessment of “physical literacy” is needed.

Measurement or assessment results can be used at multiple levels and in multiple contexts. An elementary teacher can use the results to inform his or her individual planning for physical education. School board directors can use this information to lobby for more resources to elevate the physical literacy of the students in their school board. Non-government groups can use the information to put pressure on politicians and policy makers to enact positive change at a policy level (e.g., to allocate resources, create new standards or targets, or to change current policy). National surveillance groups can also use this information to understand the state of physical literacy of Canadian children. Such measurements will help identify

areas for improvement and areas of success; it will also elevate the status of physical literacy indicators to a similar plane reserved for numeracy and literacy in the education domain. Elevating the status of physical education within the broader education system in Canada is a complicated and complex issue. Measurement-based strategies that are used to effect change are understudied, but other strategies should also be explored. Robust measurement is but one strategy to facilitate the repositioning of physical education.

Operationalizing physical literacy

Lloyd and Tremblay (in press) make the case for more robust and comprehensive assessment of physical literacy and argue that such assessments are as important as numeracy and literacy. To allow for this possibility, physical literacy must be defined in a way that guides its measurement. We suggest that:

Physical literacy is a construct which captures the essence of what a quality physical education or a quality community sport / activity program aims to achieve. It is the foundation of characteristics, attributes, behaviours, awareness, knowledge and understanding related to healthy active living and the promotion of physical recreation opportunities.

Physical literacy is the foundation of skills or tools - social/cognitive, behavioural, and fitness related - that children need to possess or develop in order to receive the inherent benefits of taking part in physical activity and sport for life-long enjoyment and success (Lloyd et al., in press; Lloyd & Tremblay, in press). Although new definitions of physical literacy emerge frequently, when operationalized we consider physical literacy to have four inter-related core domains (Lloyd et al., in press): (a) **physical fitness** (cardio-respiratory, muscular strength and flexibility), (b) **motor behaviour** (fundamental motor skill proficiency), (c) **physical activity behaviours** (directly measured daily activity), and (d) **psycho-social/cognitive factors** (attitudes, knowledge, and feelings).

Emerging literature has demonstrated that fundamental motor skills are related to physical activity (Fisher et al., 2005; Okely, Booth, & Patterson, 2001b; Saaksluhti et al., 1999; Williams et al., 2008), physical activity is related to physical fitness (Boreham & Riddoch, 2001; Physical Activity Guidelines Advisory Committee, 2008; Ruiz et al., 2006), and motor skills are likewise related to physical fitness (Barnett, Van Beurden, Morgan, Brooks, & Beard, 2008; Haga, 2008; Okely, Booth, & Patterson, 2001a). Knowledge is a critical

component of skilled motor performance (Bouffard, Watkinson, & Thompson, 1996; Wall, 2004; Wall, Reid, & Harvey, 2007), physical activity participation (Aldinger et al., 2008; Harvey et al., 2009; Tse, 2009) and physical fitness (Young, Haskell, Taylor, & Fortmann, 1996). Being physically literate is conceived to be the result of the integrated interaction of these domains to facilitate lifelong healthy physical activity behaviours (see Figure 1). To our knowledge, never before have these four domains been assessed together to create a comprehensive measure of physical literacy; yet collectively they are key/core elements of physical education curricula in every province and territory in Canada. Currently, there is no comprehensive assessment instrument to measure the multi-dimensional nature of physical literacy in Canadian school children. We believe this void needs to be filled.

Canadian Assessment of Physical Literacy (CAPL)

In response to the persistent call for objective data on physical literacy, the Canadian Assessment of Physical Literacy (CAPL) has been developed and is currently being tested. To facilitate the uptake and impact of the “physical literacy movement” we propose the development

and widespread implementation of the CAPL. The goal of the CAPL is to provide a valid, reliable, feasible and informative tool to assist in the assessment of physical literacy in Canadian children. We are currently pilot testing the CAPL on 9-13 year old (grades 4-6) Canadian children that will allow Canadian education and health experts to better understand the state of physical literacy in Canada. The CAPL is a measurement tool that assesses the four domains of physical literacy: fundamental motor skills, physical activity behaviour, physical fitness, and knowledge, awareness, and understanding. The CAPL is a hybrid of the most valid and feasibly administrable assessment modules from several pre-existing protocols and methods. See Table 1 for a list of items included in the CAPL. To measure knowledge, awareness, and understanding a new questionnaire is being developed for use in the CAPL. An international scientific expert advisory committee has also been guiding the development of the CAPL. Over 600 children have been tested in the initial phases of development and, as part of the data collection procedures, the teachers were asked to fill out a research ethics board approved questionnaire which asked their opinion of the CAPL. Based on the teachers’ responses, as well as comments from the children and the school administrators, the pilot

testing of the CAPL has been an overwhelmingly positive experience. Examples of the teacher responses include: “Kids enjoyed participating and were excited about the program” and “My overall impressions are that this is long over-due! I think it was a wonderful experience all the way through! The class was very excited to participate.”



Table 1. Summary of test items included in early versions of the Canadian Assessment of Physical Literacy.

Physical Fitness	Fundamental Movement Skills		Physical Activity Behaviour	Knowledge Questionnaire
- Leger Shuttle Run/PACER test -Partial Curl-Ups -Push-Ups -Sit & Reach Flexibility -Arm Flexibility -Back Strength -Hand Grip Strength -Height -Weight -Waist Circumference	Dynamic: Obstacle Course -Jumping -Dodging -Kicking -Hopping -Catching -Throwing -Running <i>*Time and skill execution are components required for skilled performance</i>	Static: -Throwing -Catching -Kicking -Dribbling -Striking -Balance -Running <i>*Pilot testing indicates that static skills will not be included in final version of the CAPL</i>	Pedometers worn for seven consecutive days, as well as a daily log sheet <i>*Questions in pilot version of knowledge questionnaire are used to verify PA Behaviour</i>	Questionnaire that assesses knowledge, awareness and understanding of: -Health -Physical Fitness -Motor Skills -Physical Activity Preferences <i>*Based on PE curricula for grades 4-6</i>

The recent attention paid to the importance of physical literacy has elevated the issue and brought it to the forefront. The question remains, with all the attention paid in government and non-government initiatives: *how will we know if Canadian children are "more physically literate" as a result of strategic, programmatic, or curricular initiatives if physical literacy is not actually assessed?* Interestingly, measurement or assessment is not built into any of the recent physical literacy initiatives. For example, there is no concrete plan in place to measure the effectiveness of Sport Canada's Long Term Athlete Development model at the "physical literacy" stage. We argue that

sport participation numbers now or in the future do not reflect the effectiveness of the physical literacy programming. Assessment of "physical literacy" is needed to measure the outcomes of this physical literacy programming initiative.

Conclusion

Many children today lack the basic skills, knowledge, and physical activity behaviours needed to lead healthy active lifestyles, as evidenced by the startling rates of inactivity (Active Healthy Kids Canada, 2009), obesity (Shields, 2006), and decreased fitness (Morrow, Fulton, Brener, & Kohl, 2008). New programs

and interventions are being released to promote physical literacy in Canadian children. How will we know if they are working if we do not evaluate the results of these programs? Governments, administrators, teachers, and parents need careful measurement of the impact of well-designed interventions, including new curricula. At the moment, we have no comprehensive, objective, empirical, or valid measurement protocol to assess the physical literacy movement. This absence limits and diminishes the potential impact of quality physical education in Canada. We propose that the Canadian Assessment of Physical Literacy will help to fill this gap. ■

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