Teachers' Beliefs about Implementing a Physical Literacy Program for Children & Youth

by

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ABSTRACT

Physical literacy is assumed to be important for the development of youth physical activity. In essence, those who are physically literate should lead active lives. For this reason, it is being incorporated into Canadian physical activity reports and policies. One area that physical literacy is rapidly gaining traction is in the education sector. However, it is a new construct and limited empirical evidence is available to guide physical literacy implementation in schools. The purpose of this thesis was to conduct an independent investigation of the self-efficacy and outcome expectations of teachers participating in a provincial physical literacy promotion initiative compared to an uninvolved group of teachers. This initiative is an ongoing project started by Ever Active Schools that took place in approximately 103 schools in Alberta during the 2017/2018 academic year. Teachers at 31 of these schools were administered a survey that included questions about their self-efficacy and expected outcomes of incorporating physical literacy into their teaching. A group of 90 teachers from nine other schools were recruited to act as a comparison group. Subsequent comparative analyses found no significant differences between the intervention and uninvolved teachers. Additional analyses revealed that teachers' outcome expectations and self-efficacy are moderately related and that teaching experience may have small effects on teachers' expected positive outcomes for fostering physical literacy in youth. These results suggest that future investigation of effective methods for physical literacy promotion and evaluation strategies in school contexts are needed.

PREFACE

I began studying and working in the Sedentary Living Laboratory in September 2016, with Dr. John C. Spence as my supervisor. In February 2017, Ever Active Schools approached us to evaluate the physical literacy in residence (PLR) project which was being implemented in over 100 primary and secondary schools in Alberta. In August 2017, a Mitacs Accelerate grant was awarded to support my work on the project. This was co-funded by Ever Active Schools. I was responsible for the PLR evaluation alongside my other duties as the Mitacs intern at Ever Active Schools between September 2017 and June 2018.

The full evaluation of the PLR project employed a two-study approach involving a survey and semi-structured interviews. I conducted interviews in May and June of 2018 with 29 principals and teachers in 22 schools across 10 districts. The interview data were presented in a summary report for Jumpstart, who was one of the PLR projects co-funders. For this master's thesis, I only present findings from the survey that was administered to the PLR schools and an additional nine uninvolved comparison schools.

This research is an original work by Brendan Richard Wohlers. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project name "Evaluation of the Physical Literacy in Residence Project", Study ID: Pro00070707, February 3rd, 2018. I was responsible for recruitment of the comparison and intervention schools, survey creation, survey administration, data collection, analyses, and reporting of the results.

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Background

Physical inactivity is defined as an insufficient level of physical activity to meet present recommendations (Tremblay et al., 2017). The most recent report from Statistics Canada states that only 33% of Canadian children and youth engage in an average of 60 minutes of moderate to vigorous physical activity (MVPA) per day (Colley et al, 2017). Further, physical activity levels begin to decline when young children start school (Reilly, 2016). As children progress into adolescence and eventually adulthood, sedentary behaviours rise while light physical activity (LPA) levels decrease (Dumith, Gigante, Domingues, & Kohl, 2011; Reilly, 2016). This trend has been consistent for the past decade in Canada (Colley et al., 2017).

The risks associated with physical inactivity are numerous. It is linked to increased rates of metabolic syndrome, type-2 diabetes, coronary heart disease, fatty liver disease, and breast and colon cancer, among others (Lee et al., 2012). The rates of some of these diseases, once thought to be adult specific, are seen in younger years with increasing regularity (Ng et al., 2014). Children and youth who participate in daily physical activity are less likely to be obese or overweight, have lower depressive mood symptoms, and have higher academic achievement in schools (Poitras et al., 2016).

The costs associated with physical inactivity also extend beyond health risks. The total annual estimated costs of high physical inactivity levels for Canada in 2013 was $1.1 billion (Ding et al., 2016). A briefing report from the Conference Board of Canada conservatively estimates that costs savings to health care systems could increase from $3.7 million CAD in 2015 to $167 million in 2040, with a cumulative $2.6 billion CAD in possible savings from reducing physical inactivity levels (Conference Board of Canada, 2014). Though these reports are about

adults, children who retain poor health behaviours as they mature to adulthood will contribute to these costs. In light of the compiled evidence, effective physical activity promotion for Canadian youth is required to address the current physical inactivity situation (Public Health Agency of Canada, 2018; Reis et al., 2016).

Until recently, the public health objective was to encourage Canadian children to engage in 60 minutes per day of MVPA. Now, increased interest in a breadth of movement-related behaviours has led to an emphasis on the entire 24-hour period (Tremblay et al., 2016). The Canadian 24-hour movement guidelines for children and youth were created to address this change in perspective (Tremblay et al., 2016). They now include sleep, light physical activity, and sedentary behaviour in addition to MVPA. The guidelines state that aside from at least 60 minutes per day of MVPA, several hours of unstructured and structured light physical activity (LPA) is optimal for health. As well, no more than 2 hours per day of recreational screen time is recommended and children aged 5-13 years should have 9-11 hours of sleep, while children aged 14-17 should have 8-10 hours of sleep. Overall, to meet the Canadian 24-hour movement guidelines, children and youth should be engaging in less sedentary behaviour, increased quantities of light physical activity, and more sleep (ParticipAction, 2018).

Despite the recognition that these movement behaviours are co-dependent (Spence, Rhodes, & Carson, 2017), the original challenge of increasing Canadian children's physical activity levels is still present. A consolidated effort between sectors is likely to improve the current situation (Reis et al., 2016). One related construct that is rapidly gaining recognition from the health promotion sector is physical literacy, which has been recently associated with improved adherence to the 24-hour movement guidelines in children (Bélanger et al., 2018).

Formally introduced to the global community by Dr. Margaret Whitehead in 1990, physical literacy is defined as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life" (International Physical Literacy Association, 2014; Tremblay et al., 2018, p. 14). This definition was adopted in 2015 as part of the Canadian Physical Literacy Consensus Statement, which was authored by a collaborative group of Canadian physical activity and public health organizations in partnership with the International Physical Literacy Association (Tremblay et al., 2018). The statement recognizes that physical literacy represents a unique journey for each individual and remains relevant in differing physical activity contexts. Whitehead clarifies this by explaining that the philosophical underpinnings of physical literacy stipulate that practitioners should intentionally develop children's intrinsic motivation by employing child-centered approaches that emphasize mastery activities in a wide variety of physical environments (Pot, Whitehead, & Durden-Myers, 2018). Further, youth should "gain knowledge and understanding of the principles of holistic health and therefore develop an informed position concerning the value of physical activity in enhancing all-round health and well-being" (Whitehead, Durden-Myers, & Pot, 2018, p. 8). This is in addition to physical competence, which is broadly understood as the combination of movement skills and physical fitness that enables an individual to participate in physical activities of their choice (Durden-Myers, Green, & Whitehead, 2018; Edwards, Bryant, Keegan, Morgan, & Jones, 2017).

Canada is one of the global leaders in the physical literacy movement. A recent review found that physical literacy is now a "widely established initiative and is described as the foundation for Canada's national health and sporting objectives" (Hyndman & Pill, 2017, p. 17). Similarly, a report from The Aspen Institute concludes that Canada is one of three countries in

the world investing significantly into physical literacy policies and programs (Spengler & Cohen, 2015). The Common Vision, a national policy guide for increasing physical activity and reducing sedentary behaviour, lists physical literacy as the foundation for an active lifestyle (Public Health Agency of Canada, 2018). As an evaluative standard, physical literacy is included in the recent ParticipAction report cards as an individual-level contributor to physical activity levels of children and youth (ParticipAction, 2016, 2018). Further, Canadian researchers are leading the effort to create and validate tools to measure the physical literacy journeys of youth (Cairney et al., 2017; Longmuir et al., 2015, 2018; Robinson & Randall, 2017; Stearns, Wohlers, McHugh, Kuzik, & Spence, 2018). Thus, it appears that physical literacy is an integral part of the public health sector's collaborative effort to increase Canadian children's physical activity levels (Dudley et al., 2017).

But, physical literacy still faces some challenges. One key criticism is that the enthusiasm for physical literacy has occurred quickly in the absence of published empirical support. It is a relatively untested construct and associations with related physical activity and health outcomes are only beginning to be published in academic journals (Bélanger et al., 2018). To address this, researchers are calling for robust and longitudinal physical literacy studies (Corbin, 2016; Lizotte et al., 2016; Longmuir & Tremblay, 2016). Effective methods of fostering physical literacy across large population groups need to be identified so the construct can be evaluated for its ability to aid Canadians in being physically active during childhood and later in life.

One way that physical literacy is introduced to children is through the education system (Corbin; 2016; Hyndman & Pill, 2017; Tremblay & Lloyd, 2010). For instance, it is becoming more popular in physical education teacher-education, at conferences, and during professional development events (Mandigo, Francis, Lodewyk, & Lopez, 2009). The role of physical

education teachers is the focus of much of the literature, as they are likely the best positioned to serve as the knowledge translation contacts for school-based physical literacy promotion (Mandigo, Francis, Lodewyk, & Lopez, 2009; Robinson, Randall, & Barrett 2018; Whitehead, Durden-Myers, & Pot, 2018). However, physical literacy is a relatively new construct that has had several different definitions prior to the consensus statement (Edwards et al., 2017; Hyndman & Pill, 2017). Thus, teachers may be confused about how it is different from past approaches to helping children be active and how to best foster it in practice. As Robinson and colleagues (2018) suggest, similar to other recent buzz words, it may appear to be "old wine in a new bottle" (p. 9). They conducted a case study by interviewing twelve leading Canadian physical education teachers and concluded that current practitioners understanding of physical literacy may be incorrect or incompatible with the expert opinion and guidelines (Robinson, Randall, & Barrett, 2018). In another study, Saskatchewan teachers reported a wide range of comprehension and confusion about physical literacy (Stoddart & Humbert, 2017). Many of the teachers could not articulate more than the physical competence portion of physical literacy, which may mean that one of the most essential conditions of physical literacy, those of its philosophical underpinnings, are not being adequately communicated to educators. Though these findings need confirmation by rigorous and representative studies, it may be that teacher's understanding of physical literacy is mixed due to the lack of clarity about the construct.

Ever Active Schools and the Physical Literacy in Residence project

Ever Active Schools is a special project funded by the Health and Physical Education Council of the Alberta Teacher's Association. Ever Active Schools' website states that their mission is to provide provincial leadership that promotes and supports healthy active school communities through a comprehensive school health approach (Ever Active Schools, 2014). They

spearhead collaborative projects between organizations from healthcare, education, recreation and sport, and active living. Ever Active Schools is also listed as a key organization in the Canadian effort to build consensus for physical literacy and disseminate related information (Tremblay et al., 2018).

Ever Active Schools uses the comprehensive school health (CSH) approach outlined by the Pan-Canadian Joint Consortium for School Health (JCSH) to engage with school communities. The CSH framework was developed from the Ottawa Charter for Health Promotion (Stewart-Brown, 2006; World Health Organization, 1986), and moves beyond individual focused classroom-based health approaches to involve the whole school environment (Fung et al., 2012; Veugelers & Schwartz, 2010). It includes four 'pillars' for school interventions: teaching and learning, social and physical environments, healthy school policy, and partnerships and services (Veugelers & Schwartz, 2010). These four pillars are presumed to influence each other and the student, who is in the center of the model. The CSH framework has been reported to be effective for the promotion of health behaviours in Canadian children (Fung et al., 2012; Veugelers & Fitzgerald, 2005).

Comprehensive school health organizations such as Ever Active Schools are one group that are leading the physical literacy movement in Canadian schools (Tremblay et al., 2018). This means that in practice, physical literacy is beginning to be disseminated through whole-school approaches. Recently, Ever Active Schools received funding from the Jumpstart charity to begin a physical literacy promotion program in approximately 100 Albertan schools. This Physical Literacy in Residence project (PLR) mentors teachers to increase their self-efficacy and competence for fostering physical literacy in their students. First, Ever Active Schools' staff meet with administrators to determine the school's needs and select a school health champion

among the staff, who is the main contact for the program. Then, all educators at the school are provided with professional development, resources and support, and peer mentorship, and the schools are given assistance with building community partnerships. The individuals who provide these supports are titled school health facilitators and are trained specialists in either kinesiology or health and physical education. Though the implementation may differ according to individual school's needs, the initiative provides training and resources to enhance physical education programs, increase physical activity levels in classrooms, add extracurricular intramural activities, and aid in structuring activities during recess and lunch periods. As well, district meetings between the school administrators and school champions are organized several times throughout the academic year to coordinate efforts in some regions. The PLR project takes place over 4-10 months with follow-up visits occurring regularly from Ever Active Schools. The overall goal of the project is to build sustainable capacity in the school to foster physical literacy.

Ever Active Schools needed an independent investigation of the PLR project. So, they contacted the researchers in the Sedentary Living Laboratory at the University of Alberta to assess the PLR project. As self-efficacy for fostering physical literacy and knowledge of physical literacy resources and supports were main outcomes for the teacher mentorship, the purpose of this evaluative research study was to examine the beliefs of the teachers for fostering physical literacy in their students.

Theoretical Framework for Evaluation

Behavioural theories are useful for guiding evaluations (Glanz & Bishop, 2010). They provide frameworks to understand health behaviour change from psychosocial processes and environmental factors (Rhodes, McEwan, & Rebar, in press). Several examples of theories that are effective at influencing health behaviours (e.g. physical activity, smoking cessation, dietary

habits) include social cognitive theory, the theory of planned behaviour, and self-determination theory (Glanz & Bishop, 2010; Gourlan et al., 2016). Social cognitive theory, and the self-efficacy construct in particular, have been frequently used in education (Pajares, 1996) and health promotion (Bandura, 2004; Beauchamp, Crawford, & Jackson, in press; Young, Plotnikoff, Collins, Callister, & Morgan, 2014) research.

Social cognitive theory proposes that behaviour can be explained through a core set of determinants, including the self-efficacy that one can control their behaviour, the positive and negative expected outcomes of the behaviour, the individual's goals and their plans to achieve them, and the perceived sociostructural facilitators and impediments to the action (Bandura, 1977, 1986, 1997, 2004). This evaluative study employed self-efficacy theory, a sub-theory of social cognitive theory that proposes self-efficacy and outcome expectancy may predict behaviour (Bandura, 1997). Specifically, self-efficacy is the perceived capability to perform a target behaviour (e.g. how well can you implement alternative strategies in your class when teaching physical literacy activities). Outcome expectancy is commonly understood as the expected outcome of a corresponding behaviour (e.g. discussing physical literacy with my peers will make me appear that I am informed about current trends). In self-efficacy theory, behaviour is predicated by the belief about an action's possibility of taking place, despite barriers, while the expectancy-value component explains the outcome's perceived value and whether the outcome will emerge after the behaviour (Bandura, 1997). Therefore, by influencing self-efficacy and outcome expectations, behaviour may be modified.

In summary, limited empirically documented evidence exists on the impact of physical literacy programs. Further, there are no studies that examine physical literacy implemented within the CSH framework. As the PLR project aims to influence teachers, an evaluation of

teacher's beliefs is appropriate and may provide guidance for future physical literacy interventions. Self-efficacy theory was selected to guide the evaluation because it includes the targeted beliefs of the PLR intervention, namely, self-efficacy. The following research questions were proposed.

Main Research Questions

The purpose of this thesis was to conduct an independent investigation of the self-efficacy and outcome expectations of teachers participating in a provincial physical literacy promotion initiative compared to an uninvolved group of teachers.

Specifically, it addressed the following questions:

1.0 Do differences in self-efficacy and outcome expectations exist between the teachers in the PLR intervention and the teachers who were not in the intervention?

1.1 Does physical education specialization of the teachers influence the impact of the PLR intervention on the beliefs of the teachers?

2.0 What is the association between teacher's self-efficacy and outcome expectations for fostering physical literacy?

3.0 Do new teachers have different beliefs about physical literacy promotion than experienced teachers?

Chapter 2: Literature Review

The purpose of this chapter was to synthesize the literature that is relevant to the PLR evaluation and to provide a knowledge base to draw upon during the planning stage of the study. It consists of several sections and subsections. The first section describes the history and definitions of physical literacy. The second section describes links between physical literacy and physical activity promotion and some programs that have used physical literacy. The third section describes the measurement tools for behaviour and beliefs linked to physical literacy. Later sections detail the history of the comprehensive school health framework in Canada and the current published knowledge about the effective implementation of the model. The final sections describe social cognitive theory, self-efficacy, and outcome expectations as they relate to teachers and physical literacy.

What is Physical Literacy?

The term physical literacy was used first as a counterpart to cognitive literacies in the school context since 1938 (Roetert, Kriellaars, Ellenbecker, & Richardson, 2017). The initial argument was that public schools were responsible for both the mental and physical education of youth. Margaret Whitehead was the first to introduce a specific definition of physical literacy to the academic community, which has been refined (1990, 2001, 2007, 2009, 2010, 2013a, 2013b, 2016). She conceived it as a philosophical topic, interweaving physical activity with monism, existentialism, and phenomenology. The construct slowly expanded in popularity to be a goal for physical education, sport, and recreation sectors. Now, based on a consensus of stakeholders, it is defined as: “the motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life” (Tremblay et al., 2018, p. 15), and is endorsed as important for public health agencies, among others (Dudley et

al., 2017). Though the consensus statement explains the physical literacy context and defines the components of the definition (International Physical Literacy Association, 2014), it is a complex construct and may be difficult to understand (Edwards et al., 2017). Whitehead and her colleagues went as far as to publish a special issue to provide clarity and guidance for the operationalization of the construct (Durden-Myers & Whitehead, 2018). Most of this issue focuses on physical education content and outlines how to translate the philosophical underpinnings into practice. However, other contexts (i.e. sport, recreation, research, health) have not yet been explored as thoroughly in the literature.

The philosophical underpinnings of physical literacy are different from how the Western world has traditionally understood physical activity and the body. Since René Descartes (1641), who famously stated, "I think, therefore I am", physical activity has been linked to Cartesian dualism. Thus, the body is seen as a tool for the mind. For example, a traditional rationale for physical activities in education is to refresh the mind for cognitive tasks (Pot et al., 2018). Proponents of physical literacy urge that it should be valued alongside mental literacies such as the development of reading, writing, and numeracy (Edwards et al., 2017; Roetert et al., 2017). Dewey (1938) urged a more interactive physical experience than Descartes, which has circulated in the literature until the development of what has been termed the embodied experience (Bresler, 2004; Lakoff & Johnson, 1999; Pot et al., 2018; Shusterman, 1997, 2004, 2008; Whitehead, 2001, 2010, 2013a, 2013b; Jurbala, 2015).

The concept of embodiment has been historically present in Eastern traditions such as Hinduism, yoga, and Buddhism, but not popularly embraced in the Western understanding of physical activity (Whitehead, 2010). Indeed, the term 'physical' implies a separation of mind and body, whereas embodiment does not. Whitehead (2010, 2013a) was aware of this dichotomy and

does not define the term ‘physical literacy’ from a dualist perspective, where the ‘physical’ is the body and separate from the ‘literacy’ of the mind. Rather, the integration of embodiment is implicit in the term ‘physical literacy’, where the individual experiences activity as not just a physical perception mediated by the mind but as a holistic and continuous event. This is defined as primarily a monist perspective, rather than dualist (Merleau-Ponty, 1962). Whitehead (2010) and Bresler (2004) have suggested that embodiment in physical activity involves an amalgamation of the experiential and biological/physical dimensions of physical activity.

In recent years, there has been a growing dialogue about physical activity and embodiment, and how this relates to monism (Sheets-Johnstone, 1999; Birch, 2009; Brown and Payne, 2009; Hopsicker, 2009; Brown, 2013; Jurbala, 2015). Appreciation of the monist experience is essential to understanding physical literacy (McCaffery & Singleton, 2013; Whitehead, 2007). Furthermore, Whitehead (2010) explains ‘intentionality’ in physical activity as the persistent and monist interaction with the world, suggesting physical activity as a continuous and individualized experience occurring at each stage of the day. Rather than limiting the body to select events of physical activity (e.g. an hour of MVPA), the existentialist and phenomenological views that Whitehead (2010) supports describes how individuals balance and steer their experiences to be self-affirming, intrinsically satisfying, and rewarding. In an increasingly sedentary culture, the conceptual shift away from dualism is important for developing embodied persons who engage in meaningful and regular physical activity (Jurbala, 2015). These philosophical underpinnings of physical literacy influence how the components of physical literacy such as motivation and confidence are operationalized. Hence, Whitehead and her colleagues draw links to concepts such as intrinsic motivation and self-efficacy that focus on task-oriented goals in movement contexts (Whitehead, Durden-Myers, & Pot, 2018).

One important characteristic of physical literacy is that it is intended to be important across the lifespan. Whitehead and colleagues (2018) summarized literary sources that detail the lifelong journey component of physical literacy. In her book, Whitehead (2010) gives examples of physical literacy in six stages, spanning preschool, primary school years, secondary school years, early adulthood, adult years, and older adult years. For example, development of motor competencies and self-confidence may be more pertinent in early and primary years while knowledge and understanding are developmentally more appropriate for adolescents. Similarly, a recent systematic review highlights the inclusion of the physical literacy elements in an individually interactive monist and existential experience of movement within the world, resulting in a 'physical literacy journey' (Edwards et al., 2017). An individual with stronger physical literacy elements (e.g. motivation, physical competence) across their lifespan journey is theorized to participate more regularly in physical activity. At a population level, higher degrees of physical literacy should result in higher levels of physical activity.

The past definitions of physical literacy have led to it being mistakenly substituted with 'physical activity', 'physical education', 'fundamental movement skills', or 'motor skill development' (Edwards et al., 2017). These substituted terms result in narrow operational definitions of physical literacy so that it may be more easily measured (Lundvall, 2015). However, efforts to distill the philosophical nature of physical literacy run the risk of missing its holistic nature. Attempts have been made to measure and quantify physical literacy as fundamental movement skills, motor development patterns, or physical fitness (Coates, 2011; Svozil et al., 2015; Thompsett, Burkett, & McKean, 2014). Indeed, the Fundamental Movement Skills Assessment Tool (FMS tool) by 60 Minute Kids' Club was once advertised as a physical literacy measurement (60 Minute Kids' Club, n.d.; Participaction, 2016). Though movement skill

assessments can be part of a measure of physical literacy, it has more to offer as an inclusive construct than only being measured as a marker of motor development. What is missed with this approach is the integration of other psychological concepts, such as motivation, confidence, knowledge, and understanding (Almond, 2013a; Lundvall, 2015). Nonetheless, Durden-Myers and colleagues (2018) offer an explanation of physical competence for teaching content, which includes movement patterns as one component for practitioners to focus on.

In an attempt to operationalize physical literacy, there has been a shift from the process to outcomes of the construct (Edwards et al., 2017; Jurbala, 2015). For example, Tremblay & Lloyd (2010, p. 28) explain that "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". Despite this claim, no authors have developed a causal model for physical literacy (Edwards et al., 2017). Undoubtedly, motivation and physical competence would hold a central role, but the other concepts in the consensus definition may be more or less pivotal depending on the developmental state; suggesting age as a moderating factor for the salience of physical literacy elements (Edwards et al., 2017; Hyndman & Pill, 2017; Lundvall, 2015). Future research will tell which components in the definition are most important for physical activities for life. Regardless of the value placed on the process (Whitehead et al., 2018) or outcomes (Tremblay & Lloyd, 2010), for many, participation in physical activity is the appeal for employing physical literacy. With this in mind, it is being used by groups who aim to promote physical activity.

Physical Literacy and Physical Activity Promotion

Almond and Whitehead theorize that those who participate in meaningful physical activity will come to value purposeful physical pursuits as a resource to enhance all-around

health and well-being (Almond, 2013b; Whitehead, 2010). Therefore, meaning attributed to physical activity does not equate to only disease prevention, but also other personal meanings for physical activity such as enjoyment or social inclusion. The value of movement is integral to physical literacy (Whitehead et al., 2018). Dudley, Cairney, and Kriellaars (2016) note that the salutogenic model of health promotion (Antonovsky, 1996) relates well to this notion of meaningful physical activity. Specifically, health behaviour promotion is contextually positive (salutogenesis) rather than based on negative health risks (pathogenesis) (Antonovsky, 1996; Dudley et al., 2016). Though one rationale for physical literacy promotion provided in this review is for prevention of non-communicable diseases, it is important to note the distinction between the rationale for interventions and the public promotional messaging that is used. It is acknowledged that increased physical activity leads to improved health, but to adhere to a salutogenic approach, the promotion strategies should focus on broader positive outcomes.

A key component of salutogenic health promotion is to capitalize on motivation (meaningfulness) and by viewing the entire person rather than simply the disease factors (Antonovsky, 1996). For example, in physical education, children play a ball game not just for energy expenditure and physiologically adaptive benefits, but also for outcomes such as involved social qualities, promoting democratic participation, joy associated with movement, and developed satisfaction with motor skills (Quennerstedt, 2008). Similarly, Whitehead and colleagues discuss how the sociocultural value of physical literacy is the contribution to the reduction of objectification of the body and overall human flourishing (Durden-Myers, Whitehead, & Pot, 2018; Whitehead et al., 2018). Therefore, physical literacy promotion could be integrated into a salutogenic model to follow a progressive perspective which values positive and individually meaningful motivators.

An area where physical literacy is being heavily promoted is in schools (Corbin, 2016; Ennis, 2015). This growing interest in the effects of physical literacy-based interventions on school health has sparked debate on which framework to use for schools (Demetriou, Sudeck, Thiel, & Höner, 2015; Castelli et al., 2014). The contemporary literature base has a strong focus on the physical education curriculum as a medium for promoting physical literacy (Corbin, 2016, Durden-Myers et al., 2018; Mandigo et al., 2009; Lundvall, 2015). Certainly, physical education is important for increasing children's physical activity and has been considered as a key area for physical activity promotion in the past (Hills, Dengel, & Lubans, 2015; Sallis & McKenzie, 1991; Sallis et al., 2012; Reis et al., 2016; Webster et al., 2015). Now, the experts are advising a focus on physical literacy in physical education (Roetart, Kriellaars, Ellenbecker, & Richardson, 2017). In addition, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) refers to physical literacy as one of three key components for quality physical education provision (UNESCO, 2015). Thus, it is likely that physical literacy will be an increasingly common term in physical education curricula.

Despite the recognition that physical literacy is well suited for physical education teachers, it may be promoted outside of the gymnasium. Further, it is unlikely that children can reach MVPA goals through physical education alone (Hobbs, Daly-Smith, McKenna, Quarmby, & Morley, 2017). Children are more likely to be physically active if movement is incorporated into all parts of the school day (Fung et al., 2012). So, Castelli and colleagues (2014) have proposed incorporating it in the Comprehensive School Physical Activity Program (CSPAP) model for school physical activity promotion. Grounded in the Health Belief Model (Janz & Becker, 1984), it recommends promoting physical activity in five areas of intervention: physical education, physical activity before and after school, during school hours, involving school staff,

and through family and community engagement (Erwin, Beighle, Carson, & Castelli, 2013). The goal of it is to develop a school culture that works to promote lifelong physical activity (Erwin et al., 2013). The authors of the article linking the CSPAP with physical literacy provide examples and recommendations of how key outcomes for physical activity could be reached while enhancing the overall school culture (Castelli et al., 2014). However, there is little empirical research on physical literacy interventions (Castelli et al., 2015; Longmuir and Tremblay, 2016; Lundvall, 2015).

The question remains: how to measure physical literacy in school settings (Demetriou et al., 2015). The fitness-based measurement approaches used in schools over the last 50 years are ineffective at predicting if children and youth live actively post-graduation, thus, a more holistic physical literacy-based assessment could be more appropriate (Lloyd, Colley, & Tremblay, 2010). Currently, there is very little empirical data on children's physical literacy levels. In response, several different tools have been developed in Canada and elsewhere to measure physical literacy in children and youth.

Physical Literacy Measurement Tools

One of the primary concerns of researchers is the need for development of valid and reliable measurement tools for physical literacy (Corbin, 2016; Demetriou et al., 2015; Giblin et al., 2014; Lundvall, 2015). Canada has been leading the way in assessment tool development (Robinson & Randall, 2017). The earliest developed assessment tool for physical literacy was in 2008 with the release of the CAPL by the Healthy Active Living and Obesity Research Group (HALO) (Longmuir et al., 2015b). Since then, other tools that claim to measure physical literacy have been released, including the 'Passport for Life' by Physical Health and Education (PHE) Canada, and the 'Physical Literacy Assessment for Youth' tools (PLAY tools) by Canadian

Sport for Life (ParticipAction, 2016). These tools were all created for examining children and youth and have primarily been developed for use by trained practitioners or researchers. The following is a summary of the current tools for measuring physical literacy.

The Passport for Life tool was constructed for physical education specialists for use in a school setting (Robinson & Randall, 2017; PHE Canada, 2013). The measure has been developed for grades 3-6, 7-9, and 10-12. It measures physical literacy through four components: active participation, living skills, fitness skills, and movement skills (PHE Canada, 2013). The active participation and living skills surveys are self-reported measures provided by the students. The active participation portion of the survey has 22 questions about self-reported physical activity levels and locations. Living skills are measured by a survey with 21 questions about categories of students' affective states (confidence and enjoyment), knowledge and understanding (knowledge and goal setting behaviours), and 'interacting' (social skills). The fitness skills and movement skills target cardiovascular endurance, core strength, balance, and locomotor skills (Participaction, 2016). The majority of the assessment is on the students' physical competence, with the test being roughly divided into cognitive and physical frameworks evaluated by the students and teacher, respectively. It is meant to be an ipsative assessment (measuring the progress of an individual across time without complaining to another individual) and is not recommended to be used for curricular purposes.

The Passport for Life tool has several limitations. First, there is no published body of empirical evidence about its development nor any assessments of validity or reliability. Second, there is no available evidence, peer-reviewed or otherwise, of development and implementation of these tools from a Whiteheadian perspective (Jurbala, 2015; Whitehead, 2007, 2013b). Though Robinson & Randall (2017) claim that the Passport for Life has the most fidelity to

Whitehead's philosophy compared to the other tools, this is based on Passport for Life being ipsative and includes measures of motivation and confidence. But, the other tools also include motivation and confidence. As well, this relies on the PLAYtools being defined as one test, the PLAY*fun*, and a rationalization that the CAPL deviates from Whitehead, whereas the CAPL includes in its conceptual model the latest definition from Whitehead, which is the definition used in the consensus statement (Tremblay et al., 2018; Tremblay & Longmuir, 2017). Further, the Passport for Life uses a past definition of physical literacy, namely that physical literate individuals are able to "move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the health development of the whole person" (Mandigo, Francis, Lodewyk, & Lopez, 2012, p. 6).

The PLAY tools are a series of assessment tools that can be used separately or in combination to determine an individual's physical literacy (Cairney et al., 2017). They include measurements for different assessors and purposes. The PLAYfun is an objective measure of motor competence using a visual analog scale for running, locomotor, object control– upper body, object control–lower body, balance, stability and body control. A self-report questionnaire for the child is the PLAYself, which asks about the environment and physical activity, their relative ranking of literacies, and their perceived fitness. Other assessments are adult's perspectives of the child and include the PLAYcoach, the PLAYparent, and PLAYpe for teachers. Lastly, the PLAYinventory examines leisure-time activities that the child has regularly participated in during the previous year.

The PLAY*fun* been recently validated in several studies (Cairney et al., 2017; Stearns et al., 2018). In particular, it was found to have sufficient factor structure to meet the *a priori* subscales for motor competency (Cairney et al., 2017). The interrater reliability and convergent

validity of the PLAY*fun* were shown to be of good quality (Stearns et al., 2018). It also correlated well with the Canadian Agility and Movement Skill Assessment (CAMSA) used in the CAPL. However, both of these studies had small sample sizes and were in different populations. As well, the PLAY*fun* is only one measure in the PLAY tool suit for capturing physical literacy. The other PLAY tools have not, to the author's knowledge, had validity information published.

The CAPL is the most prominent physical literacy assessment in the literature and has been recently revised into a streamlined version known as the CAPL-2 (Longmuir et al., 2018). It was developed for use with children grades 4-6 (approximately 8-12 years old) and uses a variety of assessments to measure daily behaviour, physical competence, knowledge and understanding, and motivation and confidence (Longmuir et al., 2015b). The assessments were chosen through the use of a Delpi consensus method and can be summed on a 0-100 percentile scale, with children's scores interpreted in the categories of beginning (>17th percentile), progressing (17th – 65th percentiles), achieving (65th to 85th percentiles), and excelling (<85th percentiles) (Francis et al., 2016; Longmuir et al., 2018). These first publications indicated that the measure has validity and reliability (Longmuir et al., 2015a, 2015b; Francis et al., 2016). Additionally, it follows the Canadian consensus definition for physical literacy and uses the four domains (knowledge and understanding, motivation and confidence, physical competence, and daily behaviour) as its theoretical model (Longuir et al., 2018). Apart from knowledge and understanding, the CAPL domains have been associated with adherence to Canadian physical activity and sedentary behaviour guidelines (Bélanger et al., 2018; Saunders et al., 2018).

The CAPL-2 was developed by employing a theoretical analysis and confirmatory factor analysis of all available children who had been administered the measurement (n = 10,034;

Gunnell, Longmuir, Barnes, Bélanger, & Tremblay, 2018; Longmuir et al., 2018). Prior to the revision, the CAPL was measured with 25 indicators and was a burdensome assessment (Robinson & Randall, 2017; Longmuir et al., 2015). Now, the CAPL-2 has 15 indicators and equally weights the physical literacy domains of motivation and confidence, daily behaviour, and physical competence as 30 out of 100 points each. The knowledge and understanding scale is weighted as the remaining 10 out of 100 total points in the CAPL-2. Thus, the CAPL-2 is more feasible for use than the first version (Longmuir et al., 2018).

One contention with the CAPL model is the lack of mention of an embodied experience either in the articles or the CAPL administration manual (Francis et al., 2016; HALO, 2013; Lizotte, 2016; Longmuir et al., 2015a, 2015b; Longmuir & Tremblay, 2016; Tremblay & Lloyd, 2010). The CAPL was developed in 2008, prior to the publication of *Physical literacy throughout the lifecourse* (Whitehead, 2010), which aided in refining the construct of physical literacy and explaining its' philosophical background. However, the CAPL creators claim that the CAPL adheres to Whitehead's monist principles and that the fitness measurement is integral to measuring physical competence (Tremblay & Longmuir, 2017). The CAPL's theoretical model was also revised four times since its creation in 2008 (Gunnel et al., 2018). At this point, the CAPL has the most peer-reviewed evidence for reliability and validity compared to the PLAY tools and the Passport for Life.

Other measures for physical literacy have been used prior to the Passport for Life, PLAY*fun*, and CAPL. The Fundamental Movement Skills Assessment (FMS) Tool developed by 60 Minute Kids' Club was originally considered a physical literacy measurement for teachers, recreation leaders, and coaches (Participaction, 2016). It has resources to show, teach, and assess children's fundamental movement skills (60 Minute Kids' Club, n.d). These are a combination

of lesson plans and video-based instructional videos and assessments to measure fundamental movement skills. Some examples of the fundamental movement skills in the FMS tool include types of object manipulation, locomotor skills, and non-locomotor skills. But, it does not include measures of other components of physical literacy and is primarily based on the interpretation of 'physical competence' in physical literacy from a developmental fundamental movement skills framework. Further, it was also notably not included in a recent review of physical literacy (Robinson & Randall, 2017), suggesting that its value for measuring physical literacy is low. Indeed, it is not mentioned in published literature and has likely been discarded as the definition for physical literacy was clarified. This is understandable, as it was developed using early and incomplete definitions of physical literacy that focus primarily on physical competence. However, it may still have promise as a fundamental movement skill test, rather than a physical literacy measurement tool.

Elsewhere, researchers have made suggestions or developed novel assessments. There have been developments internationally with attempts to measure physical literacy. In Hong Kong, China, a physical literacy measurement tool for physical education teachers was released, named the Perceived Physical Literacy Instrument (PPLI) (Sum et al., 2016). The PPLI is an 18-item self-report measure that uses a 5-point Likert scale. The researchers employed exploratory and confirmatory factor analysis to fit a physical literacy model and report the internal consistency of the item via Cronbach's alpha. These researchers argue that the PPLI can be used for both research and applied settings in the fields of physical education and health to measure the physical literacy of teachers and practitioners (Sum et al., 2016). However, it was validated using an earlier definition of physical literacy, mostly focusing on physical competence. As well,

it is made for a select group, focusing just on the personal physical literacy of physical education teachers.

Interestingly, Green and colleagues (2018) developed a Physical Literacy Environmental Assessment (PLEA) tool. Though not much information is available, it is described as "a program evaluation tool for multiple sectors to assess how they are implementing the principles of physical literacy" (The Sandbox Project, 2017). The PLEA uses the consensus definition of physical literacy. Though in early stages of development, the PLEA would be valuable to examine the suitability of the environment for physical literacy promotion. Given the relationship between the environment and physical activity (e.g., Spence & Lee, 2003), the environment likely serves a role in the development of physical literacy.

As mentioned, there is skepticism about the suitability of an assessment of physical literacy (Green, Roberts, Sheehan, & Keegan, 2018). As physical literacy is theorized to be an ipsative process, some have argued that physical literacy is not suitable for quantitative measurement (Lundvall, 2015). To maintain the phenomenological theory of physical literacy, it may be that the construct cannot be measured. Instead, constructs and skills that are hypothesized to lead to physical literacy can be measured and compared. Elements of the physical literacy definition can be examined between individuals and groups, whilst maintaining that the physical literacy of an individual is changing across situations and developmental stages. This distinction between the elements of physical literacy and the overall construct may be an appropriate compromise between maintaining physical literacy as ipsative and using its measurable elements to plan evidence-based interventions. Nonetheless, the ability to measure the construct and summarize it across demographic groups and geographic locations is necessary for its utility in physical activity promotion. For instance, the CAPL referred to in the Participaction report cards

(2016, 2018), offers a numerical value of the child's overall physical literacy summed from its battery of tests. Given the current trends (Dudley et al., 2017), it is likely that measurement of physical literacy will continue as it becomes more integrated into physical activity promotion.

The Comprehensive School Health Framework

Schools are efficient health promotion settings because it is possible to reach nearly all children who spend a large portion of their week in the school (Fung et al., 2012). As well, school-based interventions are generally cost-effective and contextually appropriate for promoting physical activity in children and youth (Abu-Omar et al., 2017). Children learn healthy habits through experiences at home, from their peers, and in the school environment. These health behaviours that are reinforced at a young age may be maintained later in life. Thus, schools have been popular settings for health promotion and health education since the 1950s (Stewart-Brown, 2006). The health information learned at school does not exist in isolation within the classroom environment but is also transferred between the family and community settings (Veugelers & Schwartz, 2010). Hence, health behaviours that are practiced at school will need to be reinforced in familial and wider community environments. However, earlier research has led to the conclusion that structured campaigns with familial and school staff buy-in are needed in order to effectively promote health in schools (Veugelers & Fitzgerald, 2005). The need to balance health promotion objectives while supporting schools' priorities has led the advocacy of the comprehensive school health (CSH) framework by the World Health Organization (WHO) and national agencies such as the Pan-Canadian Joint Consortium for School Health.

The Ottawa Charter for Health Promotion provided the framework for the development of the CSH model by highlighting the effect of the environment on health (WHO, 1986). The

intention behind the creation of the CSH framework was to encourage a shift from an individual behavioural approach to an emphasis on social and physical environments for school health promotion (Veugelers & Schwartz, 2010). Known as 'coordinated school health' in the United States of America, 'health promoting schools' in Europe and Oceanic countries, and CSH in Canada, it has become quite popular (Stewart-Brown, 2006). The characteristics of the framework remain constant across different terms. The WHO endorses these guidelines for a school environment: school health policies, healthy physical and social school environments, development of school/community connections, education of individual's personal health skills, and school health services (Stewart-Brown, 2006). This framework encourages a whole-school approach by considering the interactions of multiple avenues of behavioural influence. The WHO's guidelines were consolidated into four pillars about the social and physical environment, teaching and learning, policy, and partnerships and services for use in Canada (Veugelers & Schwartz, 2010). The following will refer to the framework as CSH but may cite sources that use different labels for it.

Since 2002, CSH has been included in the implementation framework of the Alberta kindergarten to grade nine Health and life skills education curriculum (Alberta Learning, 2002). In it, health education and promotion are suggested to be done at a community level. Student health is viewed ecologically as it is contextually important within the home, school, and community environment, and, requiring important social partnerships between students, parents, educators, healthcare professionals, and other relevant community supports (Alberta Learning, 2002, p. 1-2). The curriculum states that students should be encouraged to participate in healthy activities outside of an individual class context. However, an important critique of this inclusion is that the health subject is not part of the provincial standardly assessed school subjects (i.e.

mathematics, English language arts, sciences, and social studies) and limited data is available about how it is being taught across the province. So, though it is unclear how much the curriculum has influenced school practices, it is evident that CSH has been accepted by school support groups and established in Alberta school policy as a popular practitioner framework for health behavior promotion.

Two groups have employed the CSH framework for promoting physical activity in Alberta: the Alberta Project Promoting active Living and healthy Eating in Schools (APPLE Schools) and Ever Active Schools. APPLE Schools is a semi-privately funded organization working in many schools across central and northern Alberta and aims to promote healthy eating, physical activity, and mental health. Ever Active Schools is a provincial initiative funded by the Health and Physical Education Council of the Alberta Teacher's Association. These two groups have different objectives but work in a collegial capacity.

Implementation of Comprehensive School Health

Several reviews have found that the CSH framework is effective for increasing physical activity or fitness levels in youth (Langford et al., 2011; Stewart-Brown, 2006; Veugelers & Fitzgerald, 2005). Yet, there is great variability in the implementation design of the CSH framework and many studies show small effects or none at all (Langford et al., 2011; Storey et al., 2012). Despite the endorsement of the WHO and its popularity among practitioners, few rigorous studies have been published on how to effectively implement the CSH framework (Samdal & Rowling, 2011). The small empirical base led to a push in research and reviews to identify essential factors for effective implementation of the CSH framework (Hung, Chiang, Dawson, & Lee, 2014; Langford, Bonell, Jones, & Campbell, 2015; Storey et al., 2012, 2016). Though the work has been promising, the two reviews published are qualitative in design (Hung

et al., 2014; Langford et al., 2015). Systematic reviews using meta-analytic techniques have not yet been conducted on effective CSH interventions.

Teachers are an important asset for the effective implementation of CSH (Bonde, Stjernqvist, Sabinsky, & Maindal, 2018). Factors that are relevant to the teachers for effective implementation include a need to improve self-efficacy and define clear expectations for teachers (Storey et al., 2012). Teachers also indicate that professional development provided in the form of training and resources increases their support for the project (Storey et al., 2016). Similarly, another review reports that training and support for teachers are especially appreciated (Langford et al., 2015). Teachers also need to believe in the support of the school administration and be shown through evidence that the intervention will facilitate positive and relevant student outcomes (Storey et al., 2016). Many studies report high acceptability yet mixed fidelity, suggesting a discrepancy in school teacher's beliefs of or ability to adhere to the intervention (Bonde et al., 2018; St Leger, 2000; Taylor, Noonan, Knowles, Owen, & Fairclough, 2018).

For successful school-based intervention, the goals of the intervention should be parallel to the original goals of the teachers. The primary function of schools and consequently, the goals of teachers, is for their students to achieve curricular objectives. In this, the goals of physical activity promotors and classroom teachers may be at a crossroads. Time spent in physical activity may take away from curricular time. To increase physical activity levels, some might turn the focus instead on enhancing physical education (Hills et al., 2015). But, physical education is not equated to physical activity time and doing so may overload the physical education teachers, arguably key stakeholders in the school's physical activity culture (Ennis, 2011). In fact, physical education policy objectives state that physical education should incorporate approximately 50%-80% of physical activity within the class time (Hobbs et al.,

2017). This is in addition to instructional time and not in consideration of activities in PE that may not reach MVPA levels of exertion. Further, physical education teachers have their own curricular objectives that extend beyond engaging children in MVPA (Beauchamp, Rhodes, & Niggs, 2016). Depending on the school and province or territory, physical education may include health and nutrition classes, field trips, or motor skill practice. Instead, using a whole school approach to integrate physical activity is recommended (Ennis, 2011). This way, classroom teachers and physical education teachers are both responsible for children's physical activity.

Additionally, there is little published information on the perceived outcomes and motivations of teachers involved in CSH programs (Storey et al., 2012; Tjomsland, Iverson, & Wold, 2009). According to a three-year follow-up study that used the CSH framework and examined outcomes of teachers, perceived positive outcomes are necessary for the sustainability of health promotion programs in schools (Tjomsland et al., 2009). However, this study had a relatively small sample (104) for a large amount of time between measurements, leading to a higher risk of committing an error in the follow-up measurement conclusion, and it had an unspecified intervention. Thus, the available information on teacher's expected outcomes in a CSH intervention is minimal.

Currently, there is no known peer-reviewed literature that empirically examines the implementation or evaluation of physical literacy in schools. Yet, teaching with physical literacy is listed as a key hallmark of quality physical education programs in schools (Hobbs et al., 2017; Mandigo et al., 2009; UNESCO, 2015). Teacher beliefs have not been rigorously examined, even as teachers are encouraged to use physical literacy (Roetert et al., 2017). Physical literacy is also being incorporated into some of the Canadian CSH organizations. Given the documented success

of the CSH framework (Fung et al., 2012), the integration of physical literacy into CSH will, in theory, result in increased capacity for children to engage in physical activity.

Teacher Training and Professional Development

Effective professional development. Professional development is one of the main methods that the PLR intervention uses to influence teaching practices. It is important to understand the context of effective professional development for teachers when doing school-wide physical activity interventions. A framework of a professional development system includes the teachers, the facilitators, the program itself, and the context of the school or community it is being placed into (Borko, 2004). In order to increase adherence to an initiative, teachers need to believe that the goals of the initiative will align with their own attitudes and beliefs (Armour & Yelling, 2004; Lander et al., 2017; Lumpe, Vaugh, Henrikson, & Bishop, 2014). Furthermore, teachers respond better to programs that include having specified goals and future evaluations of the program (Borko, 2004). Professional development leaders should also use content that is organized to facilitate a collaborative and continuous approach to teachers' learning (Armour & Yelling, 2007). So, interventions need to include ways that the teacher training can be applied to students in various environments and teaching situations (Armour & Yelling, 2004, 2007). Professional development should be inclusive of these factors to fully engage teachers in effectively changing their classroom practice.

Teacher training for physical activity interventions. Recent systematic reviews and a meta-analysis that focused on physical activity interventions in schools found that teacher training in physical activity interventions is applied inconsistently and with mixed results (Lander et al., 2017; Naylor et al., 2015; Webster, Beets, & Phillips, 2015). More, due to poor reporting, the role that teacher training has on interventions outcomes is not well understood

(Lander et al., 2017; Webster et al., 2015; Taylor et al., 2018). The evidence available advises that teachers need to perceive that they are competent, capable, and have access to multiple teaching strategies to adapt and retain pedagogical practices (Lander et al., 2017). However, a more robust pool of evidence is needed. One study on the implementation of classroom physical activity concludes that while physical activity interventions are important, teacher training and support resources are likely ineffective without being based in conjunction with evidence-based strategies (Carlson et al., 2017). Thus, there has been a recent push to create evidence for effective school-based interventions and policies (Carlson et al., 2017; Fung et al., 2012; Lander et al., 2017; Naylor et al., 2015; Storey et al., 2016; Weatherson et al., 2017). Some authors have advised that whole-school approaches (e.g. approaches that change school and district policy and enlist substantial supports for teachers from surrounding areas) are a likely candidate framework for effectively creating sustainable physical activity-positive climates in school communities (Carlson et al., 2017; Fung et al., 2012; Langford et al., 2015). Weatherson and colleagues (2017) suggest that once interventions have stronger teacher fidelity, there will be more value in measuring the effectiveness of different interventions and this gap in the literature can more easily be addressed.

An Overview of Self-Efficacy Theory

Behavioural theories can guide studies and interventions and were historically employed in fields wherein behaviour influences health, such as education, medicine, psychology, and environmental planning (Gourlan et al., 2016). Bandura proposed a notion of triadic reciprocal causation which specifies that human agency (intentional action) influences and is influenced by determinants of internal personal factors in the form of cognitive, affective and biological events; environmental influences; and an individual's behaviour (Bandura, 1986, 1997). The influence of

the determinants on an individual's agency depends on the situation that they are in. Furthermore, this agency is a continuously adapting process and is specific to each person. Bandura (1997) also states that this agency relies heavily on cognitive self-regulation through self-referent thought. This reflection and the consequent action is based upon constructs that Bandura has defined in his social cognitive theory and sub-theory, self-efficacy theory.

Social cognitive theory has a set of determinants that explain and predict behaviour (Bandura, 2004). Individually proximal determinants of behaviour are situationally contextual knowledge, perceived self-efficacy about an action, outcome expectations, goals, and sociostructural facilitators and impediments (Bandura, 2004). Self-efficacy is an individual's perceived capability to perform a specific behaviour (Bandura, 1997). It influences behaviour directly and also influences the other determinants in the social cognitive model (Bandura, 2004). Behavioural goals are value-specific and guide action generally or specifically to inform the actions of an individual (Bandura, 1997). Sociostructural impediments and facilitators are proposed to affect behaviour through the planning and attainment of goals. Outcome expectations are the anticipated rewards or consequences of the behaviour.

Self-efficacy theory represents the relationship in social cognitive theory between the outcome expectancy and self-efficacy constructs to explain behaviour (Bandura, 1997). It is posited that individuals anticipate the outcomes that occur after the behaviour, which then influences the motivation to perform the behaviour. However, self-efficacy precedes outcome expectations in the causal model and influences behaviour both individually and through its effect on the outcomes (Bandura, 2004). Further, there are four sources of self-efficacy: enactive mastery experiences that serve as indicators of capability; vicarious experiences that alter efficacy beliefs through transmission of competencies and comparison with the attainments of

others; verbal persuasion and allied types of social influences that one possesses certain capabilities; and physiological and affective states from which people partly judge their capabilities, strength, and vulnerability to dysfunction (Bandura, 1977). These collective sources contribute to the belief that one can accomplish a certain task regularly despite barriers that may be present, titled self-regulatory efficacy (Bandura, 1997).

Bandura explains that several of the constructs in social cognitive models are different types of outcome expectations (Bandura, 2004). A separate review of the outcome expectancy construct agrees that outcome expectancies vary little across behavioural theories and that it has been a stable construct since the 1930s (Williams, Anderson, & Winett, 2005). For example, attitudes from the theory of planned behaviour can be interpreted as similar to outcomes in social cognitive theory. The difference in the predictive models is how outcome expectations are positioned to be influencing behaviour. For instance, attitudes in the theory of planned behaviour predict intention to behaviour, whereas outcome expectations in social cognitive theory directly influence behaviour. Thus, the outcome expectations observed in various models may be similar, but the hypotheses, a priori analyses, and causal interpretations may vary between theories.

The three types of outcomes are proposed to be physical, social, and self-evaluative (Bandura, 2004). Self-evaluative outcomes concern the expected positive and negative perspectives or feelings about oneself after a behaviour, while physical outcome expectations are the bodily sensations or material losses, and social outcomes are the approval or disapproval in interpersonal relationships (Bandura, 2004). Further, scholars suggest that outcome expectations can be measured as the likelihood of an outcome and the estimated value of an outcome, and that an outcome is moderated by the perceived temporal proximity of the outcome (Ajzen & Fishbein, 2008; Hall & Fond, 2007; Maddux & Rodgers, 1983; Rodgers & Brawley, 1996;

Williams et al., 2010). An example of a highly predictive belief would be to have a temporally proximal, likely, and highly desirable outcome. Thus, outcome expectations and self-efficacy together are proposed to be able to predict and explain a large portion of behaviour (Bandura, 1997).

According to self-efficacy theory, outcome expectations and self-efficacy should be included in measurements that intend to explain behaviour (Bandura, 1997, 2004). Teacher self-efficacy is a popular construct in educational research because it is viewed as a major determinant of effective teaching (Martin et al., 2008). Despite the focus on self-efficacy, past measures of teacher self-efficacy do not adequately include outcome expectations (Tschannen-Moran, Hoy, & Hoy, 1998). For teachers, positive outcome expectations may be necessary for delivering effective and sustainable interventions physical activity interventions in schools. A recent example of a large-scale school-based physical activity intervention that found ineffective results suggests a lack of teacher approval as one of the possible reasons for null findings (Kipping et al., 2014). Whether examining self-efficacy or outcome expectancies, influencing teacher beliefs is undoubtedly important for effective and sustainable interventions.

Teacher self-efficacy for physical activity promotion. Self-efficacy is one of the main constructs used for creating professional development programs (Lumpe et al., 2014). However, self-efficacy is behaviour specific and may differ amongst different types of teachers (Bandura, 1997). Though physical education teachers may feel efficacious in their role as PA promotors, generalist classroom teachers need to receive training to encourage self-efficacy in their ability to incorporate more physical activity into the classroom (Webster, 2011). Directly after a professional development program, teacher's self-efficacy for teaching physical activity content is high but drops after teachers start to use the new content in their classroom (Martin,

Mccaughtry, Hodges-Kulinna, & Cothran, 2008). As teachers start to incorporate new content into their practice, their self-efficacy may have an 'implementation dip' due to encountering barriers and need to adjust their pedagogical strategies accordingly (Martin et al., 2008). So, effective teacher-based physical activity interventions need to be longitudinal and include time for teacher reflection and collaboration. Indeed, others have found that teachers require approximately 130 hours of engagement with a new concept to successfully implement it in their classrooms (Armour & Yelling, 2007; Lander et al., 2017). As teachers build their self-efficacy for incorporating physical activity into general practice, their practice should change to reflect their beliefs and attitudes (Bandura, 1997; Lumpe et al., 2014; Martin et al., 2008). To summarize, teacher training and professional development should be collaborative, continuous, involve teacher reflections, have built-in teacher assessments, focus on creating and sustaining teacher self-efficacy, and have follow-up evaluations.

Measurement of Teacher's Self-Efficacy and Outcome Expectations

Many measures of teacher self-efficacy exist (Ashton et al., 1982; Bandura, n.d.; Gibson & Dembo, 1984; Riggs & Enochs, 1990; Tschannen-Moran, Hoy, & Hoy, 1998; Tschannen-Moran & Hoy, 2001). The most influential measure of teacher self-efficacy is the Teacher Sense of Efficacy Scale (TSES) (Tschannen-Moran & Hoy, 2001). It has been shown to have good validity and reliability in North American and international schools (Nie, Lau, & Liau, 2012; Tschannen-Moran & Hoy, 2001). Further, the TSES has moderate invariance across 32 countries and high invariance across similar countries or cultures (Scherer et al., 2016). There is a short form (12 items) and long form (24 items) of the TSES. Both forms have been shown to have comparable reliability and validity and hold against dimension reduction analyses (Tschannen-Moran & Hoy, 2001). The primary focus of self-efficacy in the TSES is a general teaching self-

efficacy that is focused on an approach to pedagogical content knowledge (PCK) rather than content knowledge (CK). Content knowledge is the knowledge about a specific subject, such as biology, music, or mathematics. Whereas PCK is the skills and knowledge to successfully plan and implement a diversity of pedagogical approaches, which are dependent on multiple student learning styles and developmental levels (Lander et al., 2017). The focus on PCK allows for the TSES to be generalized across different school subjects. Effective teachers display a high level of both PCK and CK (Lander et al., 2017) and have an adequate level of teaching self-efficacy (Bandura, 1997, pp. 240-243). Because teaching is a complex behaviour that often involves these three skills at the same time, the correlation of these factors is appropriate and considered a strength when examining overall teacher self-efficacy (Scherer et al., 2016).

Since self-efficacy is situation specific (Bandura, 1997), a scale was needed that measures the most salient type of self-efficacy for fostering physical literacy. Several considerations were made when examining the self-efficacy measurement scales. First, the intervention is promoting physical literacy self-efficacy of teachers via a comprehensive school health framework and therefore targets more than just the physical education teacher. One of the choices that were considered when choosing a self-efficacy scale was to pick a scale for teaching physical education. Teachers targeted by the intervention are not all physical education teachers and the physical literacy activities taught to the students may not always be in the physical education space (i.e. outdoor spaces, active classrooms). There have recently been physical education teacher self-efficacy tools developed (Humphries, Hebert, & Daigle, & Martin, 2012; Kern & Graber, 2017) but they focus on physical education content knowledge and pedagogical content knowledge. The teachers who are not physical education specialist would likely report low self-efficacy on these scales, physical literacy trained or not. The differences in pedagogical

knowledge required for physical education specialists and other teachers are quite different, as certain pedagogical knowledge is necessary for applying concepts such as classroom management skills and instructional strategies in a gymnasium or outdoor setting versus a seated classroom setting. Further, these tools have little evidence of validity and reliability. Additionally, the original form of the TSES examines the general classroom environment. General teaching self-efficacy in teachers was not deemed to be appropriate because physical activity teaching contexts are quite different pedagogically than a seated classroom.

Physical literacy has been mistakenly used synonymously with physical education in the past, leading to inaccuracies in some policy and practice distinctions (Hyndman & Pill, 2017; Lounsbery & McKenzie, 2015). As well, physical literacy is a holistic experiential construct that exists inside but also outside of the traditional physical activity spaces, which means that appreciation and motivation of physical activity can be incorporated into classroom and school-leisure activities (Edwards et al., 2017; Whitehead, 2007). Simply measuring self-efficacy for physical education to determine the self-efficacy for fostering physical literacy would be inaccurate. As well, the quality of the physical education self-efficacy scales has not been tested as extensively as the TSES (Breslin et al., 2012; Nie, Lau, & Liau, 2012; Scherer et al., 2016; Tschannen-Moran & Hoy, 2001) and would be more difficult to modify to this study's specific purpose. For this study, a form of self-efficacy called physical literacy self-efficacy is proposed as a term for general physical literacy activities directly taught or incorporated into school spaces. After the considerations presented here, the short form of the TSES was chosen to be the scale used for this research. It was then modified to inquire about self-efficacy for fostering physical literacy in teaching practice.

There are many published articles that detail policy and pedagogical recommendations for physical literacy but none examine teachers' outcome expectations for physical literacy using empirical methods. Furthermore, most of the research about how teachers perceive changes to educational practice has been qualitative (Martin et al., 2008).

Arguably, an ideal combination of constructs for behaviour change among teachers would be high self-efficacy combined with high outcome likelihood and desirability, and temporally proximal outcomes. Including these characteristics of outcome expectancies allow for different controls of the motivational antecedents (as outcome expectations) to behaviour. This combination of outcome expectancy measures along with self-efficacy will allow for a thorough understanding of teacher's expectations for instruction while using physical literacy. Thus, teacher behaviour might be explained via outcome expectations being causal to the perceived capability of the teachers to implement changes to their practice for physical literacy promotion (Bandura, 1977, 2004; Williams & Rhodes, 2016).

Few relevant articles were found examining teacher's perceived outcomes for implementing physical activity-based interventions. A systematic review conducted with 39 articles about teacher training characteristics for FMS and physical activity interventions also found few studies that measured teacher expected outcomes (Lander et al., 2017). As well, Weatherson and colleagues (2017) use theoretical domains framework (Atkins et al., 2017) to identify barriers and facilitators for physical activity policies, in which 'beliefs about consequences' may be interpreted as outcome expectations. Both review articles examined different teacher characteristics and note that the quality of reporting on teacher beliefs for physical activity interventions is low Lander et al., 2017; Weatherson, Gainforth, & Jung, 2017). They speculate that in many of the studies they reviewed, teachers' roles in interventions are

overlooked or teachers are anecdotally assumed to have aligned goals to the intervention. So, teachers' beliefs may be underreported in school-based physical activity interventions. Three other studies that were not in the previously mentioned reviews were included (Cale, Harris, & Duncombe, 2016; Jenkinson & Benson, 2010; Magnusson, Sigurgeirsson, Sveinsson, & Johannsson, 2011). Shared outcome expectations in these studies are school administrative support, effects on time constraints and an already crowded curriculum, student behaviour during and after physical activity, and improved health benefits for their students.

The results from this review was used to develop the outcome expectation scales for the PLR evaluation study (See Appendix A, Table 1). More information on the scale construction for outcome expectations is provided in the methods section of this document.

Summary

The expert understanding of physical literacy is still evolving. It has been recognized as an interdisciplinary construct, embraced in public health, sport, recreation, and education sectors. However, the empirical evidence on its ability to predict future physical activity for life is minimal. Measurement tools have been created to examine the levels of physical literacy in children and in physical education teachers, but no studies have been done to examine effective implementation for practitioner beliefs about physical literacy. Schools are one of the main avenues that physical literacy is communicated to the public and teachers are key stakeholders in school-based interventions. Therefore, evidence contributing to an understanding of teacher beliefs about physical literacy promotion is needed. Given that implementation of physical literacy is well underway in Canada, research to evaluate interventions in schools is in demand.

This literature review informed the study in several ways. First, it explained physical literacy and how physical literacy is situated within the context of physical activity promotion.

Second, a description of the measurement tools for physical literacy was given. Then, the comprehensive school health framework was defined, which was the implementation framework of the PLR. As the PLR focused on professional development, some attention was given to exploring effective training for teachers in physical activity interventions. Finally, self-efficacy theoy was described followed by a review of relevant tools for measuring teacher beliefs. This thesis will explore the relationships between teacher beliefs and physical literacy in a comprehensive school health intervention.

Chapter 3: Methods

Design

This cross-sectional quasi-experimental study independently evaluated the PLR program being administered by Ever Active Schools in Alberta in the 2017-2018 academic year. A sample of intervention schools was recruited from the schools in the PLR. Comparison-group schools were purposefully recruited based on similar characteristics (i.e., size, school district location, urban/rural status, and grade range) to the intervention schools.

Participants

A total of 103 elementary, middle, and high schools participated in the PLR intervention during the 2017-2018 academic year. Assuming an average of 15 teachers per school, the number of teachers involved in the PLR project is estimated to be approximately 1,545. Based on a power analysis, the quota for intervention schools for this study was set at 30 prior to the evaluation. Out of the 103 original schools, 14 schools (13.5%) were located in the Edmonton area and excluded from recruitment due to not applying for special ethics approval from the local school boards. One school district in the Calgary area that had two (1.9%) PLR schools, also had special ethics approval required, and thus were not contacted. Nine of the PLR schools (8.7%) were excluded because of slowly progressing interventions. The remaining 78 schools were randomized in a Microsoft Excel spreadsheet using the numerical random generator method described by Trochim and Donnelly (2008). The principals of the first 30 schools were contacted to ask if their school would participate. Some principals (n = 45) declined or did not respond to recruitment emails and their schools were removed from the selection process. The remaining

uncontacted schools were re-randomized and contacted until 31 principals had agreed to participate. However, a total of 76 (97.4%) of 78 principals were contacted to ask for verbal consent to participate in this PLR evaluation. The selection process is thus close to convenience sampling of the available intervention schools because most of the schools was contacted.

The principals of the consenting PLR schools were asked to distribute the survey to their entire teaching staff. At the time of the survey, the 31 PLR schools had approximately 472 teachers. A total sample of 129 teachers subsequently completed the survey, resulting in a participation rate of 27.3%. An additional 9 comparison schools were selected outside of the PLR project for a total 40 schools in the study. There were approximately 137 teachers in the comparison schools. Following the same procedure as the PLR schools, 90 teachers responded to the survey, resulting in a participation rate of 65.7%. Thus, the total sample size was 219 educators across both the intervention and comparison schools.

Measures

The participants were administered a survey including questions about demographic characteristics, self-efficacy for fostering physical literacy, and outcome expectations for fostering physical literacy. A second section of the survey was done for Ever Active Schools and has not been included in this thesis. The full survey was pre-tested by eight University of Alberta graduate students and required 15-20 minutes to complete. Social cognitive theory experts were consulted to examine the face validity of the belief scales and the adherence to theoretical assumptions. The survey included a total of 94 questions (see Appendix C).

Demographics. Information was collected on gender, years of teaching experience, physical education specialist training, and the name of the school. Years of teaching experience was measured in 5-year ordinal intervals (e,g, 0-5 years, 6-10 years, 11-15 years, 15-20 years, and 20 or more years). Teachers were also asked if they had or had not participated in professional development opportunities related to physical activity, physical literacy, and/or health or physical education in the past year.

Physical literacy self-efficacy. The Teacher Self-Efficacy Scale (TSES) was chosen to measure teaching self-efficacy (Tschannen-Moran & Hoy, 2001). It was created after a review of 8 previously constructed teacher self-efficacy scales, including Bandura's teacher efficacy scale, and modeled after social cognitive theory (Tschannen-Moran et al., 1998 Tschannen-Moran & Hoy, 2001). The scale has a 3-factor structure from 12 items: instructional practices (4 items), classroom management (4 items), and student engagement (4 items). These inquire about pedagogical knowledge rather than subject-specific content knowledge, so they are apparently relevant to all teachers. The items use a 9-point scale anchored from 'nothing' to 'a great deal'.

The TSES was modified to be specific for teaching physical literacy based on a review of the TSES literature (Breslin et al., 2012; Nie, Lau, & Liau, 2012; Scherer et al., 2016; Tschannen-Moran, Hoy, & Hoy, 1998; Tschannen-Moran & Hoy, 2001) and the review of physical literacy conducted for this proposal,. The TALIS study, conducted by Scherer and colleagues (2016), examined the invariance of the TSES using exploratory structural equation modeling (ESEM) from a sample of 163,687 teachers across 32 countries and recommended that researchers may describe more domain-specific beliefs in future TSES research. In addition, the TSES had been altered previously in an exploratory study that examined self-efficacy in

educators for teaching physical activity-based lessons and it retained excellent internal consistency (Breslin et al., 2012). Thus, the items asked about embedding physical literacy into pedagogical practice. The modified TSES for physical literacy underwent confirmatory factor analysis (CFA) and internal consistency testing to examine the dimensions of the scale. Then, a score for each factor was calculated by computing the unweighted means of the items. The sum of the total means represents total teacher self-efficacy for fostering physical literacy.

Outcome expectations. To the author's knowledge, no published studies exist about measuring educator's expected outcomes for fostering physical activity or physical literacy. So, a literature review was conducted to find examples of teacher`s expected outcomes for fostering concepts related to physical activity. Literature reviews have been used previously to develop outcome expectation measurement tools for specific studies (Wójcicki, White, & McAuley, 2009). This review examined qualitative studies and reviews that discuss teacher outcome expectations for physical activity interventions. Teacher beliefs were identified and outcome expectations were extracted from the texts. Perceived benefits, which may be interpreted as positive outcome expectations, were included in this summary, after careful examination (Bandura, 2004; Williams, Anderson, & Winett, 2005). Additionally, generalist teachers may have different beliefs for teaching physical activity than physical education specialists (Beauchamp et al., 2016). So, studies examining generalists were included, as the PLR was a whole-school intervention (see Appendix A, Table 1).

After the literature review, a total of 24 outcomes were created based on the summarized expected outcomes of teachers for fostering physical literacy. Past truncated conceptualizations of outcome expectancies have led to over-measurements of positive outcomes (Williams, 2010). Because of this observation, items had positive and negative versions (for a total of 48 item

stems). The items were created to follow Bandura`s theorized physical, social, and self-evaluative outcome expectancies categories (Bandura, 1997, 2004). To avoid duplication, the number of items was reduced to 12 for the survey based on the ratio of expectations commonly measured in the literature review (Atkins et al., 2017; Landers et al., 2017; Storey et al., 2016; Weatherson et al., 2017). Also, this number of outcomes was deemed to be appropriate to prevent respondent burden.

As there is limited literature specifically on examining educator outcome expectations for facilitating physical literacy, the stems were created according to the following considerations. The scale was structured to include positive and negative outcomes (Bandura, 2006; Williams et al., 2005) and included affective stems, of which more research is needed (Williams & Rhodes, 2016). Each stem is measured in three ways: for value, likelihood, and temporal proximity (Ajzen & Fishbein, 2008; Hall & Fong, 2007; Maddux & Rodgers, 1983; Rodgers & Brawley, 1991, 1996; Rodgers & Gauvin, 1998; Williams, Anderson, & Winett, 2005; Williams, 2010; Williams & Rhodes, 2016). Outcome likelihood is the person's estimate of the likelihood that the outcome will follow a given behaviour (Bandura, 1977; Rodgers & Gauvin, 1998). Outcome value is the subjective personal value of the outcome occurring (Maddux, Norton, & Stoltenberg, 1986; Williams & Rhodes, 2016). Temporal proximity is the perceived proximity of the outcome occurring and may work to moderate the influence of the outcome on behaviour (Hall & Fong, 2007; Li, 2013; Williams, Anderson, & Winett, 2005).

Therefore, 36 responses were required for the 12 outcome expectation items. The likelihood and value scales were measured on a 100-percent sliding agreement scale to increase variability in the responses (Bandura, 2006). Anchors for the sliding scales were set from "unlikely" to "likely" and from "undesirable" to "desirable", for likelihood and value,

respectively. The temporal measures were an ordinal scale: less than a week, 1-4 weeks, 1-2 months, 2-5 months, half a school year to a full school year, 1-2 school years, never, and unsure. The value, likelihood, and temporal proximity scales all underwent internal consistency testing and confirmatory factor analyses to examine the factor structure.

Procedures

The school principals were recruited in March to May 2018. Subsequently, in May and June 2018, the participants were administered the survey via an electronic link passed on by the principal. The data were collected and managed using REDCap electronic data capture tools hosted at the University of Alberta (Harris et al., 2009). This is a secure web-based application designed to support data capture for research studies and provides: 1) an interface for data entry; 2) audit trails for tracking data manipulation and exports; 3) automated export procedures for seamless data downloads to common statistical packages; and, 4) procedures for importing data from external sources. Data analysis began four weeks after the survey had been administered.

Prior to starting the study, ethics approval was granted by the University of Alberta Research Ethics Board. All participants received a consent information form (Appendix B) that stated they give implied consent by completing the online surveys. Names were not collected and teachers have remained anonymous. The data were accessible only to the researchers and all information will be kept on password-protected computer inside the locked offices of the researchers for a period of five years (until 2023).

Incentives were offered to the comparison-group schools in the form of education resource packages from Ever Active Schools that were valued at approximately $200 CAD. In

addition, the comparison schools were mailed coffee shop gift cards valued at $5 (CAD) to be distributed to the teaching staff and school administration, regardless of participation. These values were considered to be appropriate to incentivize schools to participate and were feasible for Ever Active Schools to support. No incentives were offered to the intervention schools. The total incentive expenses were approximately $2600 CAD.

Data Analyses

It was hypothesized that:

H1.0 : Teachers exposed to the PLR intervention will have significantly different self-efficacy and outcome expectations than the comparison teachers;

H1.1 : Teachers with formal physical education training will show different self-efficacy and outcome expectations for physical literacy than teachers without physical education training across the intervention and comparison groups;

H2.0 : The teacher's self-efficacy and outcome expectations will be highly related, and;

H3.0 : New teachers will have significantly different beliefs about physical literacy than more experienced teachers.

The descriptive data were analyzed using IBM SPSS version 25 software. The data entry was completed by the REDCap system, which converted the raw results directly into an SPSS readable-format. Prior to hypothesis testing, descriptive statistics were generated, and the data distributions were checked to examine statistical assumptions. All of the scales had a slight negative skew to the distributions. The scale totals were checked for outliers by identifying z-

scores in excess of 3.29 (Field, 2013). Two outliers were identified from the outcome expectations scales and three outliers from the self-efficacy scale. Though the outliers had responded to the demographic questions, they were omitted from analysis because of little to no variability in their responses or only responding to one to two items in the belief scales.

The hierarchical structure of teachers being nested within schools warranted examination for statistical assumptions of normality and independence of observations. So, an analysis employing a two-level regression model with no independent variables (an unconditional model) was used to determine if the individual and scale variables showed sufficient shared variance among the schools to warrant methods accounting for high non-independence of observations and non-normality (Tabachnick & Fidell, 2007). This was done by checking the intraclass correlation coefficient (ICC) of each variable, which represents the amount of variance common among the teachers within each school. According to Heck and colleagues (2014), if the ICC is greater than 0.05, then an analysis that accounts for shared group variance should be employed. The ICCs of most variables were found to be greater than 0.05 and are presented in Table 3. Therefore, analyses that assume normal distributions and independence of observations were unsuited and software that could make appropriate corrections was required for this dataset.

MPlus 7 software is better suited than SPSS 25 to deal with non-normality and non-independence of observations in regression and factor analysis. It includes a correction method called the maximum likelihood estimator (MLR) that uses standard errors and chi-square statistics robust for non-normality and non-independence of observations to account for clustered variance in complex survey data. Another function of MPlus 7 is the default use of a maximum likelihood estimator (MCAR) to account for missing data by assuming that missingness can be a function of observed covariates and observed outcomes (Tabachnick & Fidell, 2007). These

functions increase the power of the analyses and reduce type-1 error inflation. Thus, due to the high ICCs, non-normality, and some missing data, MPlus 7 was used for the hypothesis testing and factor analyses.

Prior to the factor analyses and hypothesis testing, the internal consistency of the scales was computed by checking the Cronbach's alpha. The scales were gauged by criteria standardly used in health psychology questionnaires with good (α = .70-.89) or excellent (α > .90) set as appropriate ranges (Terwee et al., 2007). The individual items were examined to see if the internal consistency was substantially reduced. No items were excluded. After the CFA, the scales were re-examined. Again, none were excluded due to poor internal consistency.

Before proceeding with hypothesis testing, CFA was employed to identify the factor structure of the physical literacy TSES. A priori power for the factor analyses was determined using MacCallum and colleague's recommendations (1996). With the modified TSES's 12 items and proposed 3-factor structure, the degrees of freedom was 49 (Rigdon, 1994). For the outcome expectation measures' 12 stems and proposed 3-factor structures, the degrees of freedom for this model was also 49 (Rigdon, 1994). The tests attempted to reject a not-close fit of the model with an alpha of 0.05 and a power of 80%. With the stated parameters, a minimum sample of 218 was needed for the factor analyses (MacCallum et al., 1996).

A close fit to a 3-factor structure of instructional practice, classroom management, and student engagement was expected for the modified TSES. Therefore, analyses examining the 1-factor model and a 3-factor model were completed. The model fits were compared for expected outcomes scales and the modified TSES scales using the Sartorra-Bentler scaled chi-square difference statistic (Sartorra & Bentler, 2010). The best fitting models were kept for analysis. Any items that did not fit the models were excluded prior to the hypothesis testing.

In addition, CFA was used to identify the factor structure of the outcome expectations item models. Separate analyses were completed for the likelihood, value, and temporality scales. The models were anticipated to have a close fit to a 3-factor structure of physical, social, and self-evaluative outcome expectations. However, the factor fit of two items in the outcome expectancy scales was very poor. These items were the negative outcomes expectancies from the theorized physical outcome expectation scale (See Appendix A, Table 2). Following the assessment of fit and model revision procedure detailed by Kelloway (2015), those two items were omitted from analysis. One of the three anticipated factors then had only one item left, which is not enough to comprise a separate subscale. So, a 2-factor model fit was examined for the outcome expectancy scales instead of a 3-factor fit. Finally, the same comparative testing procedure for the self-efficacy scales was conducted for the outcome expectancy scales.

The first hypothesis served as the main hypothesis for this thesis. To test hypothesis 1.0, seven multiple regressions were employed to examine if the schools' condition (intervention, comparison) significantly predicted the three outcome expectations scales, three self-efficacy subscales, and the total TSES scale. Gender, geographic location, and physical education training were entered into the models as covariates. To test hypothesis 1.1, seven regression models were constructed to examine if an interaction between physical education training and inclusion in the PLR intervention significantly predicted teacher's outcome expectations, TSES total score, and physical literacy self-efficacy subscales. Gender and geographic location were included as covariates.

To test hypothesis 2, separate linear regression analyses were completed with the total TSES and the TSES subscales as the criterion variables and each of the value, likelihood, and temporal outcome's total scores as predictor variables. Normally, the relationship between two

continuous variables would be examined by computing Pearson's correlation coefficients. Instead, regression models were employed to determine the magnitude of associations between self-efficacy and outcome expectations because of clustered variance in the sample and the corresponding risk of inflated Type-1 error in the calculation of confidence intervals and significance tests. Thus, the R-squared are presented as approximate measures of the relationships between the reported beliefs. A multiple regression with the three total outcome expectation scores regressed onto the total modified TSES score was constructed to examine the full model.

To test hypothesis 3, seven linear regressions were constructed with years of teaching being regressed onto the total TSES score and all three outcome expectation scales. Years of teaching was coded dichotomously with new teachers being compared against teachers with greater than five years of experience.

To ascertain the sample size required to detect a significant effect for the linear and multiple regressions, Cohen's (1992) guidelines were employed. A medium effect size ($R^2 = .1304$) was assumed for the calculations with an alpha of 0.05 (Cohen, 1992). The sample size necessary for the linear regression with one predictor variable and the multiple regressions with three and four predictor variables are 85, 76, and 84, respectively (Cohen, 1992). This provides a power of 80% to reduce the chance of making a type II error when testing this study's hypotheses. If the effect size was less than the stated assumption, then caution was used in interpreting the findings.

In summary, the effect sizes, descriptive means, standardized beta coefficients, and scale guidelines were examined to gauge the meaningfulness of the results.

Chapter 4: Results

Measurement Models and Reliability Analyses

All model tests used MLR estimation as implemented in Mplus 7 and were based on the covariance matrix (Kelloway, 2015). Fit indices for the CFA are presented in Table 4. The self-efficacy scale was tested for a one-factor model and a three-factor model. The three-factor model achieved a somewhat model fit (χ^2 [41] = 84.77, $p < .001$, RMSEA = .076, CFI = .95, SRMR = .041). The one factor model fit less well (χ^2 [54] = 165.80, $p < .001$, RMSEA = .105, CFI = .88, SRMR = .051), and was found to be significantly different using the Sartorra-Bentler scaled chi-square difference statistic (Sartorra & Bentler, 2010) of $T\tilde{}_d = 66.97$, $\Delta df = 13$ ($p < .001$). Standardized factor loadings ranged from .64 to .97 for classroom management, .85 to .89 for student engagement, and .73 to .81 for instructional strategies. Item 11 was removed due to mediocre fit within the model (.57) and speculation that it was irrelevant to teacher's self-efficacy for student engagement in physical literacy. Thus, the final model kept for analysis was a three-factor fit with four items in instructional strategies and classroom management, and three items for student engagement.

The outcome expectancy scales were examined for one-factor model and two-factor models in separate CFA procedures. The one-factor likelihood model achieved a somewhat model fit (χ^2 [27] = 53.35, $p = .002$, RMSEA = .074, CFI = .96, SRMR = .039). The two-factor likelihood model found a similar fit (χ^2 [26] = 49.18, $p = .003$, RMSEA = .079, CFI = .96, SRMR = .036), and was found to be significantly different ($T\tilde{}_d = 3.09$, $\Delta df = 1$, $p < .05$). However, based upon the fit of the other two outcome expectancy models, the one-factor model was kept. The standardized factor loadings range between .67 and .87. Due to poor fit, items 5, 8, and 10

were removed from the model and ranged from .10 to .48. Next, the expectancy scale for outcome value was examined. The one-factor value model was found to have a somewhat model fit (χ^2 [27] = 90.22, $p < .001$, RMSEA = .116, CFI = .88, SRMR = .052). The two-factor value model also achieved a somewhat fit (χ^2 [26] = 82.57, $p < .001$, RMSEA = .112, CFI = .90, SRMR = .049), but the models were found to be significantly different ($T\tilde{}_d$ = 5.58, $\Delta df = 1$, $p < .05$), and the one-factor model was kept due to slightly better fit. The standardized factor loadings range between .61 and .91. Items 5, 8, and 10 ranged from .13 to .56 and were removed from the model. Finally, the temporal proximity scale was tested. A one factor model for temporal proximity achieved a somewhat model fit (χ^2 [27] = 67.42, $p < .001$, RMSEA = .099, CFI = .93, SRMR = .04). The two factor model found a similar fit (χ^2 [26] = 70.55, $p < .001$, RMSEA = .105, CFI = .92, SRMR = .04), and the models were not found to be significantly different ($T\tilde{}_d$ = 0.59 , $\Delta df = 1$, $p > .05$). Similar to the prior outcome expectation scales, items 5, 8, and 10 were removed. The standardized factor loadings range between .82 and .92. As the three outcome expectancy scales were similar, the one-factor model for temporal proximity was kept for the main analysis. Thus, the number of items in the outcome expectation scales was reduced to nine items in a one-factor scale prior to hypothesis testing.

To assess whether the self-efficacy and outcome expectation scores had internal consistency, Cronbach's alpha was computed. These results are presented in Table 5. For the 11-item TSES for physical literacy, the score was excellent ($\alpha = .93$). The self-efficacy for physical literacy subscales had good internal consistency, with classroom management being .86, instructional strategies as .85, and student engagement with .89. Similarly, the 9-item outcome expectation scales were all excellent ($\alpha = .93$ - .97). After inspection, no items were removed due to any substantial reductions in Cronbach's alpha scores (Field, 2013). Therefore, the self-

efficacy scores ranged from good to excellent and outcome expectations were excellent, indicating high internal consistency for the belief scales.

Main Analysis

The sample demographics statistics are displayed in Table 6. Many of the teachers report not being trained for physical education (n = 180, 82%). A wide range of years of teaching experience was reported across the sample and was not skewed towards any range of experience. Of the total sample, most were female (n = 169, 80%) with approximately one fifth being male (n = 43, 20%). Pearson chi-square tests were employed to examine the demographic proportions between groups. A significant association existed between gender and intervention status, χ^2 (1) = 6.91, $p < .01$, indicating that gender proportions are unequal between groups. Significant differences were found between urban and rural proportions in the PLR and comparison groups, χ^2 (1) = 9.71, $p < .01$. However, there were approximately equal proportions of physical education specialists χ^2 (1) = 1.23, $p > .05$, and new teachers (< 5 years teaching experience) and experienced teachers χ^2 (1) = 3.66, $p > .05$ between groups. Therefore, geographical location and gender were included as covariates for the comparative analyses.

The means and standard deviations of the belief measures are presented in Table 7. The TSES scores ranged between “some influence” (5) and “quite a bit” (7), with a mean of 6.62 for the PLR teachers and 6.17 for the comparison teachers. Similarly, the subscales for fostering physical literacy ranged from 6.49 to 6.76 for the intervention teachers and 5.97 to 6.35 for the comparison teachers. Therefore, on a 9-point scale from “nothing” to “a great deal”, the scores for both groups of teachers were approximately equivalent to a belief that they can have some strong influence for fostering physical literacy in their students (Tschannen-Moran & Hoy,

2001). The expectancy scores for the teachers ranged between 73% and 76% agreement for perceived likelihood and value of the physical literacy outcomes, meaning that the likelihood and value are perceived positively. The intervention teachers and comparison teachers reported a mean of 3.11 and 3.42 for temporal proximity respectively, indicating that they believe the outcomes will occur within 1-2 months of their fostering physical literacy.

Hypothesis 1.0 and 1.1. The findings of this main hypothesis are presented as interaction analyses followed by main effects. The results of the self-efficacy analyses are presented in Table 8. After controlling for gender and geographic location, no significant interaction effects were observed between PLR and comparison teacher groups and physical education training on the full TSES scale for fostering physical literacy (B = .363, $p > .05$). As well, no significant interactions were found when examining the subscales for student engagement self-efficacy (B = .720, $p > .05$), instructional strategies self-efficacy (B = -.012, $p > .05$), or classroom management self-efficacy (B = .447, $p > .05$). Further, the main effects analyses revealed no significant differences between PLR and comparison teachers for the self-efficacy subscales, nor the full TSES scale. The main effects of physical education teacher specialization on the self-efficacy subscale for instructional strategies was found to be significant (B = .665, $p < .01$). However, no other main effects between physical education training and self-efficacy beliefs for fostering physical literacy were statistically significant.

The results from the interaction analyses on outcome expectation are displayed in Table 9. No significant interactions were found between physical education specialization and inclusion in the PLR for likelihood of outcomes after controlling for the covariates (B = 7.47, $p > .05$). Similarly, no interaction effects were found on value of outcomes (B = 3.92, $p > .05$) or temporal proximity of the outcomes (B = -.848, $p > .05$). Neither of the main effects analyses on

inclusion in the PLR or physical education specialization on teacher expected outcomes found statistically significant results. As no significant differences were found between the PLR and comparison teachers for any of the belief scales, the sample was collapsed across groups for the remaining hypothesis testing.

Hypothesis 2. The linear regressions showed that the reported self-efficacy and outcome expectations of teachers for fostering physical literacy are highly related. The magnitude of the associations between variables are shown as an R^2 matrix in Table 10. Significant associations were found between self-efficacy for fostering physical literacy and beliefs about the likelihood and value of expected outcomes of doing so, ranging from $R^2 = .121$, $p < .05$ to $R^2 = .178$, $p < .001$. The temporal proximity of the outcomes was not found to be significantly related to any perceived self-efficacies for fostering physical literacy.

Hypothesis 3. The results of the multiple regressions examining the association between teaching experience and beliefs about fostering physical literacy are presented in Table 11. This comparative analysis found no significant differences in most of the beliefs about fostering physical literacy between teachers with less than five years of experience and experienced teachers. However, significant differences were found between new teachers and more experienced teachers about their belief about the temporal proximity of expected outcomes for fostering physical literacy in youth. The beta weights and means suggest that the new teachers ($M = 2.78$, $SD = 1.10$) believe that the positive outcomes of fostering physical literacy will occur sooner than experienced teachers ($M = 3.40$, $SD = 1.35$). Specifically, new teachers report that they believe they will see the outcomes at approximately 1 month, while experienced teachers report that it will take a few months. The complete model comprised 5.2% of the variance, but it was not statistically significant.

Chapter 5: Discussion

The purpose of this thesis was to conduct an independent investigation of the self-efficacy and outcome expectations of teachers participating in a provincial physical literacy promotion initiative compared to an uninvolved group of teachers. Most respondents reported moderate self-efficacy for fostering physical literacy and favourable outcome expectations for fostering physical literacy in their students. However, no differences existed in beliefs between the PLR intervention teachers and the comparison teachers. Nor did physical education training influence the reported impact of the PLR on teacher's self-efficacy and outcome expectations. Unsurprisingly, physical education teachers had higher self-efficacy for creating and using instructional strategies to foster physical literacy than the generalist teachers. This is to be expected as the relationship between teaching physical education and promoting physical literacy is likely quite high (Corbin, 2016; Mandigo et al., 2009). Additionally, regression analyses revealed that the magnitude of associations between outcome expectations and self-efficacy for fostering physical literacy are substantial. Lastly, teaching experience may have small influences on the beliefs of teachers about physical literacy promotion, namely that less experienced teachers expect positive outcomes to occur sooner. The following discussion explores the possibilities for the null results and suggests future opportunities of study.

One of the main target outcomes for the PLR intervention is self-efficacy of teachers for fostering physical literacy. Bandura states that the four sources of self-efficacy are mastery experiences, vicarious experiences, social persuasion, and physiological states of arousal (Bandura, 1977, 1997). It was expected that by giving professional development, strengthening community supports, having co-teaching sessions, and giving resources to the PLR teachers, their self-efficacy would be higher than a comparative uninvolved sample. Certainly, this

intervention provided opportunities for the teachers to have mastery experiences and vicarious experiences through the professional development and co-teaching. Additionally, some social persuasion may have been present from administrators or the school health champion. So, the teacher's self-efficacy may have been affected by the intervention. However, the survey was administered at the end of the academic year, which, for some schools, might have been months after the initial intensive visits by the school health facilitator. Moseley and colleagues (2003) found in a study on outdoor education self-efficacy that teachers self-efficacy is high immediately after professional development but drops as they integrate new practice into their teaching. This may have happened during the PLR program, making the teacher's self-efficacy difficult to maintain over time. Furthermore, Martin and colleagues (2008) suggest that implementing real change for teaching practices is be a multi-year process. Therefore, it is possible that the influence of the PLR project was not maintained until the time of the survey.

The teachers may have inconsistent knowledge about physical literacy, which would contribute to this study's null findings. Recent research in Canada has found that knowledge of physical literacy is still a developing topic amongst teachers (Robinson & Randall, 2018; Stoddart & Humbert, 2017). That is, teacher's understanding of physical literacy is incomplete or limited to movement skills and confidence for physical pursuits. Interestingly, many of the participants in these studies indicated that they do not find physical literacy unclear. Thus, while the PLR teachers were likely informed about physical literacy, the comparison teachers may have been unaware that their knowledge about physical literacy is incomplete. This confusion would contribute to a mismeasurement of beliefs for physical literacy promotion, as the prior knowledge about physical literacy may have been different for the PLR and comparison teacher groups. A situation like this was anticipated prior to survey administration, so the consensus

definition of physical literacy was provided in the survey, but it is unclear whether this influenced survey responses.

Another possibility for the null results may be due to a weak intervention. In the past, documented physical activity interventions have encountered barriers to implementation, summarily described as being due to the complexity of working within school settings (Naylor et al., 2015; Weatherson et al., 2017). This suggests that the teacher beliefs may be difficult to manipulate. Different factors across geographic locations and school districts could present barriers to the PLR. As well, school district policy on physical activity in schools may influence the intervention. Indeed, this may be in the form of funding, which is often cited as a contextual factor for health promotion in schools (Storey et al., 2016). It is worth considering that a more intensive intervention is required to significantly change physical literacy promotion beliefs, one that provides more consistent support to the schools in the form of funding, additional resources, support staff, changes to school policy and curricular goals, and accountable objectives. Furthermore, the PLR initiative may have been delivered at varied intensities at different schools.

It is possible that some teachers colloquially interpreted the “can I” self-efficacy items as “will I” questions for motivation (Williams & Rhodes, 2016). Teachers might believe that they have the pedagogical content knowledge and classroom management experience to implement physically active pursuits in their classrooms. But, other factors may act as barriers to physical literacy promotion, such as priorities placed on student’s core academic achievement (e.g. math, science, English language arts, social studies), the school’s availability of activity spaces and physical activity resources, other academic pursuits such as music, or that students often move between teachers in a school day (particularly as the students progress into division 2 and 3).

Simply put, the issue is not if teachers can do it, but if they have competing interests then engaging children in physical activity may not be the first priority. Despite the responsibility for the promotion of physical activity being increasingly messaged as shared by the whole school community, such as in comprehensive school health models (Storey et al., 2016), broader shifts in the education sector may be necessary. The hypothesized relationship between individual teacher's beliefs and their use of physical activity in the classroom may be mediated by many other barriers and facilitators that are outside of the teacher's control. Hence, it is suggested that future studies evaluate teacher beliefs about fostering physical literacy, but also measure children's physical literacy to examine if teacher self-efficacy for fostering physical literacy translates into measurable differences in child-level physical literacy indicators.

It is unsurprising to find no significant differences between the outcome expectations of the PLR and comparison teachers. The goal of the PLR was to influence the self-efficacy of the teachers for fostering physical literacy, rather than the outcome expectations. But it was assumed that outcome expectations would be influenced to some degree by the PLR. According to self-efficacy theory, knowing the outcome expectations is important to understand motivations that precede behaviour (Bandura, 1997). So, considering that physical literacy promotion is a new topic, examining the outcome expectations of the teachers would have been valuable to understanding perceived beliefs. But no comparative differences were found and the study was cross-sectional, so no explorative analyses were appropriate for discerning further information.

The finding that the likelihood and the value of the expected outcomes are linked to the self-efficacy is similar to the theorized link between these beliefs in self-efficacy theory (Bandura, 1997). This may mean that assessing self-efficacy for fostering physical literacy in isolation may give incomplete information about whether an intervention influenced teacher's

practice. According to Bandura, outcome expectations are considered prior to behaviour taking place, in addition to whether an individual can accomplish the behaviour. So, teachers may perceive benefits of physical literacy promotion as possible and valuable. This study could not examine causality between these outcomes, so future longitudinal physical literacy research that examines both the expected outcomes and self-efficacy of teachers is necessary to fully understand this relationship.

It should be noted that no significant relationship was found between the temporal proximity measure for outcome expectations and the self-efficacy measures. This may be because self-efficacy is behaviour and context specific, so the temporality outcome was too distal to have an accurate relationship. Hall & Fong (2007) describe in their temporal self-regulation theory (TST) that the psychological significance of an outcome (labeled connectedness beliefs in their theory) is moderated by whether the rewards of the behaviour will be received proximally or distally. Thus, stronger values are attributed to more temporally proximal rewards. Additionally, in TST self-efficacy is explained as the perceived likelihood of future behaviour based on one's past experiences with that same behaviour. As such, rational decisions like the planned incorporation of physical literacy related content into lesson planning and school extracurricular events may be influenced by the temporality of it. The teachers in this study reported that they expect the outcomes to occur within an average of several months. Employing TST, it is reasonable to interpret that the distal outcomes perceived by teachers makes the relationship with their perceived self-efficacy difficult to predict.

The small but significant difference found between new teachers and experienced teacher's perceptions of outcome temporality may be explained by results in a recent study on physical literacy (Stoddart & Humbert, 2017). The authors found that teachers with 0 to 15 years

of experience “were more likely to have a full or partial understanding of physical literacy than participants with 16 to 30 years of teaching experience” (p. 9). They speculate that newer teacher training programs are more adequately preparing teachers for physical literacy education or that inexperienced teachers are attending more professional development opportunities. In the PLR intervention, previous experience with physical literacy may influence the efficacy of the professional development from Ever Active Schools. Thus, the newer teachers who reported slightly more proximal expected outcomes for fostering physical literacy may have a more accurate prediction for what may happen. Of course, more research is needed to explore the topic of teaching experience on physical literacy promotion, or even physical activity promotion, but it suggests an interesting area for investigation.

Strengths

This study has several strengths. First, it is one of the first to examine teacher’s beliefs about fostering physical literacy in children and youth. It was also one of the first to investigate physical literacy within a comprehensive school health intervention framework. Third, the use of a comparison group gives some strength to the design, though no significant results were found. Fourth, the data were collected from schools in different parts of the province suggesting that representation of the total PLR group took place. Next, though the survey was newly created and not pre-validated, the use of an internal consistency analysis and dimension reduction analyses diminished the risk of low reliability. Finally, the use of a behavioural theory allows for easier replication by future studies.

Limitations

Several limitations of this study should be noted. The study design is cross-sectional and quasi-experimental, which does not allow an assumption of causality in any influence of the PLR intervention. Causality may only be inferred from longitudinal designs that exclude outside influences to a reasonable degree. As well, selection bias may be present, as the principals were asked if they would like to participate. This risk may be higher in the intervention schools because no incentives were offered for participation. Further, the final sampling method was not randomized. Also, though attempts were made to equalize the comparison group to the intervention sample, a final urban school was not recruited by the end of the academic year and the intervention schools had a higher ratio of urban teachers. As a result, geographic location was controlled for in the comparative analyses.

It is important to discuss forms of validity when completing survey research (Trochim & Donnelly, 2008). A limitation is that the survey was newly created. But, steps were taken to limit the risk of measurement error. Though the self-efficacy survey was derived from a validated scale, the modifications were untested before administration. The outcome expectations items were created from a literature review to be applicable to the PLR intervention and had not been psychometrically tested prior to the data collection process. No gold standard for the measurement of teacher's beliefs about fostering physical literacy exists, so no criterion or convergent validity testing could take place (Kelly, Fitzsimons, & Baker, 2016; Terwee et al., 2007). Still, it was examined by social cognitive theory experts for face validity and underwent dimension reduction and internal consistency analyses. Additionally, the range of items was theoretically comprehensive, specific, and covered many facets of a teacher's professional day. The teachers were provided the definition of physical literacy to ensure that they knew the construct.

There were power constraints for the analyses. In particular, a smaller than recommended sample may have reduced the probability of finding a significant model fit in the factor analyses. To be deemed reliable, small effect sizes require larger samples and many of the analyses revealed small associations between variables. Thus, future studies examining teacher beliefs may endeavor to recruit a larger sample or conduct the validity and evaluative testing in separate studies.

Last, this study examined teacher's beliefs to evaluate the intervention, as the PLR intervention targeted teacher's self-efficacy for fostering physical literacy. Children's physical literacy levels were not examined. Hence, the question remains about the degree that children's physical literacy may be influenced by comprehensive school health interventions. Despite this, the rationale for measuring teacher beliefs is that it could have informed other physical literacy interventions. The measured outcomes were about teacher's social beliefs, curricular objectives, administrative support, work-related stress, and personal affect for fostering physical literacy. Though no conclusive results were found in this study, teacher practices for fostering physical literacy may be influenced by these factors.

Implications

The offer presented by Ever Active Schools to evaluate the PLR was a timely opportunity to explore how teacher's physical literacy beliefs may be measured. The survey found no evidence of the PLR teachers having different beliefs than the comparison teachers. It indicates that this widespread physical literacy intervention that used multiple methods to influence teacher's practice did not significantly change teacher's beliefs for fostering physical literacy in

the short term. Regardless, physical activity promotion groups can use null results to improve current programs and avoid implementing ineffective interventions (Wake, 2018).

Physical literacy is a complex construct that is relatively unexplored in applied contexts. Thus, intervention implementation may require further study to discover the factors that ensure effective changes to teacher's beliefs for fostering physical literacy. These studies will advance knowledge about physical literacy in schools and save funding that would otherwise be used for ineffective promotion.

Conclusions

This study provides no conclusive evidence of the PLR teachers having different beliefs than teachers who have not been exposed to the PLR intervention. Therefore, we cannot suggest that the PLR was effective at creating measurable influence on the belief variables. However, it is likely that teacher's self-efficacy and outcome expectations for fostering physical literacy are closely related. Also, different demographic traits among teachers such as teaching experience and physical education training may be moderators for physical literacy promotion beliefs. Finally, we speculate that policy factors such as school curricula, physical activity policy, and the school environment may be increasingly relevant to those aiming to increase PA in schools.

Future Directions

Future research that explores the causal relationships between physical literacy and health outcomes is needed. Though experimental designs may be unsuited for CSH research (Stewart-Brown, 2006), well-designed intervention studies with large sample sizes that include diverse geographic locations and individual characteristics may play a role in exploring the hypothesized relationships between physical literacy and health. Studies such as this are generalizable and

could play a role in evaluative documents such as the ParticipAction report card and provide information for physical literacy-related policy.

Given the increasing use of physical literacy in education curricula and physical activity policies, it is important for researchers to understand how practitioners are implementing the construct. While it is important to remember that children and youth are the focus of these efforts to increase physical activity, it is unlikely that meaningful change will take place unless adult practitioners are informed about effective methods to influence components of physical literacy. Qualitative methods are likely the best suited to explore how physical literacy is perceived among practitioners. Then, next steps are to develop valid and reliable measurement tools for adult's (i.e. coaches, teachers, parents) perceived ability to promote physical literacy in children.

Future research should examine how physical literacy may be operationalized in general school environments. Much of the literature discusses how physical literacy may be incorporated into physical education curricula (Corbin, 2016; Lundvall, 2015; Roetart et al., 2018). But, given that it is being operationalized in other contexts (Dudley et al., 2017), there is a need to identify factors that influence the use of physical literacy by education professionals. Generalists may be confused about why physical literacy should be meaningful to their practices, especially as it was once thought to be synonymous with physical education outcomes (Lounsbery & McKenzie, 2015; Lundvall, 2015). Further, researchers should examine if the consensus statement is seen to be usable within classroom environments (Tremblay et al., 2018). Some components of the physical literacy definition (i.e. knowledge and understanding, motivation) may be more teachable in the classroom while components such as physical competence and confidence may be more easily fostered in the school's physical activity spaces. These areas need to be examined

and measured on a wide-scale, as there is currently, to the author's knowledge, no system of accountability for school's physical literacy that has the same rigor as curricular subjects.

Behavioural theories may be employed in the future to examine physical literacy. Though physical literacy is a complex construct, investigating its use with established theory might speed the development of a knowledge base. This way, researchers build from past information about related concepts (e.g. movement behaviours, movement skills). Within social cognitive theory, self-efficacy and expected outcomes of practitioners for fostering physical literacy might be explored by other researchers. Also, examining the goals and sociostructural factors that influence the decision to facilitate physical literacy may be an important topic. Other theories, such as the theory of planned behaviour (Ajzen, 1991), could be valuable for exploring intention for fostering physical literacy. But, these social cognitive approaches have limitations (Rhodes et al., 2018). Other theoretical frameworks, such as ecological models, could be used to frame different levels of influence, distal and proximal, on physical literacy within the school environment (Spence & Lee, 2003). Physical literacy implementation could be investigated using other frameworks such as the behaviour change wheel (Michie et al., 2011) or the theoretical domains framework, which has been used recently to review factors that influence physical activity policies in Canadian schools (Weatherson et al., 2017).

The role of physical literacy within the comprehensive school health framework may be another interesting investigative avenue. For instance, Storey and colleagues (2016) have made promising headway into how to optimize the implementation of CSH interventions and improve physical activity and nutritional behaviours in children. It is likely that increased physical activity leads to improved physical literacy. But, studies that explore if the influence of these interventions on children's physical literacy are needed. It may be that other school physical

activity promotion models are better suited for physical literacy (Castelli et al., 2014). Further, investigating how physical literacy may fit within extra-curricular policies may provide guidance for health promoters, teachers, and principals.

Much work has been done by experts to explore physical literacy on a conceptual level, but the amount of data available on children, adults, specific populations, and practicing professionals is scarce. Many of the areas noted by Longmuir & Tremblay (2016), and Corbin (2016), among others, remain unexplored. As well, social and environmental factors that influence physical literacy need to be explored, both theoretically and practically. The available data on teacher's knowledge is concerning and suggests that more work needs to be done to explain how to implement the construct (Randall et al., 2018; Stoddart & Humbert, 2017). The specific factors necessary for successful physical literacy implementation by school health organizations are not yet confirmed. However, despite these unexplored research areas, physical activity promotion groups are proceeding with physical literacy programs. Addressing the gaps identified by this current study and others are the next steps to understand how physical literacy may be employed effectively in physical activity promotion.

References

60 Minute Kids' Club. (n.d.). The Fundamental Movement Skills Assessment Tool, Fundamental Movement Skills Library. Retrieved from http://health-mt.com/fms-library.

Abu-Omar, K., Rütten, A., Burlacu, I., Schätzlein, V., Messing, S., & Suhrcke, M. (2017). The cost-effectiveness of physical activity interventions: A systematic review of reviews. *Preventive Medicine Reports*, *8*, 72-78.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Ajzen, I., & Fishbein, M. (2008). Scaling and testing multiplicative combinations in the expectancy–value model of attitudes. *Journal of Applied Social Psychology*, *38*(9), 2222-2247.

Alberta Learning. (2002). Health and Life Skills Kindergarten to Grade 9 Program of Studies. Retrieved from https://education.alberta.ca/health-and-life-skills/program-of-studies/

Alberta Learning. (2000). Program of Studies for Kindergarten to Grade 12 Physical Education. Retrieved from https://education.alberta.ca/physical-education/program-of-studies/everyone/contact-information/

Almond, L. (2010). Physical Literacy and the Older Adult Population. In Whitehead M. (2010). *Physical literacy throughout the lifecourse*. London: Routledge Taylor & Francis Group.

Almond, L. (2013a). Physical literacy and fundamental movement skills: An introductory critique. *Journal of Sport Science and Physical Education,* 65, 81-89.

Almond, L. (2013b). What is the value of physical literacy and why is physical literacy valuable. *Journal of Sport Science and Physical Education*, *65*, 35-41.

Armour, K. M., & Yelling, M. R. (2004). Continuing professional development for experienced physical education teachers: Towards effective provision. *Sport, Education and Society*, *9*(1), 95-114.

Armour, K. M., & Yelling, M. (2007). Effective professional development for physical education teachers: The role of informal, collaborative learning. *Journal of Teaching in Physical Education*, *26*(2), 177-200.

Atkins, L., Francis, J., Islam, R., O'Connor, D., Patey, A., Ivers, N., ... & Lawton, R. (2017). A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implementation Science*, *12*(1), 77.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191.

Bandura, A. (1986). *Social Foundations of Thought & Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York, NY: W.H. Freeman & Co.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, *31*(2), 143-164.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In Urdan, T., & Pajares, F. (Eds). *Self-efficacy beliefs of adolescents*, *5*(307-337). United States: Information Age Publishing, Inc.

Bélanger, K., Barnes, J. D., Longmuir, P. E., Anderson, K. D., Bruner, B., Copeland, J. L., ... & Law, B. (2018). The relationship between physical literacy scores and adherence to Canadian physical activity and sedentary behaviour guidelines. *BMC Public Health*, *18*(2), 1042.

Beauchamp, M. R., Crawford, K. L., & Jackson, B. (in press). Social cognitive theory and physical activity: Mechanisms of behavior change, critique, and legacy. *Psychology of Sport and Exercise*.

Beauchamp, M. R., Rhodes, R. E., & Nigg, C. R. (2016). Physical activity for children in elementary schools: Time for a rethink? *Translational Behavioral Medicine*, *7*(1), 64-68.

Birch J., E. (2009). A Phenomenal Case for Sport. *Sport, Ethics and Philosophy*, *3*(1), 30-48.

Bonde, A. H., Stjernqvist, N. W., Sabinsky, M. S., & Maindal, H. T. (2018). Process evaluation of implementation fidelity in a Danish health-promoting school intervention. *BMC Public Health*, *18*(1), 1407.

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, *33*(8), 3-15.

Bresler, L. (2004). *Knowing bodies, moving minds: Towards embodied teaching and learning,* Netherlands: Kluwer Academic publishers.

Breslin, G., Hanna, D., Lowry, R. G., McKee, D., Haughey, T., & Moore, N. (2012). An exploratory study of specialist and generalist teachers: Predicting self-efficacy in delivering primary physical education. *Working Papers in the Health Sciences*, *1*(1), 1-9.

Brown, T. D. and Payne P. G. (2009). Conceptualizing the phenomenology of movement in physical education: Implications for pedagogical inquiry and development. *Quest*, *61*(4) 418-441.

Brown, T.D. (2013). A vision lost? (Re) articulating an Arnoldian conception of education 'in'movement in physical education. *Sport, Education and Society, 18*(1), 21-37.

Cairney, J., Veldhuizen, S., Graham, J. D., Rodriguez, C., Bedard, C., Bremer, E., & Kriellaars, D. (2018). A construct validation study of PLAYfun. *Medicine and Science in Sports and Exercise*, *50*(4), 855-862.

Cale, L., Harris, J., & Duncombe, R. (2016). Promoting physical activity in secondary schools: Growing expectations,'same old'issues?. *European Physical Education Review*, *22*(4), 526-544.

Carlson, J. A., Engelberg, J. K., Cain, K. L., Conway, T. L., Geremia, C., Bonilla, E., ... & Sallis, J. F. (2017). Contextual factors related to implementation of classroom physical activity breaks. *Translational Behavioral Medicine*, *7*(3), 581-592.

Carson, V., Hunter, S., Kuzik, N., Gray, C. E., Poitras, V. J., Chaput, J. P., ... & Kho, M. E. (2016). Systematic review of sedentary behaviour and health indicators in school-aged children and youth: An update. *Applied Physiology, Nutrition, and Metabolism*, *41*(6), S240-S265.

Castelli, D. M., Centeio, E. E., Beighle, A. E., Carson, R. L., & Nicksic, H. M. (2014). Physical literacy and comprehensive school physical activity programs. *Preventive Medicine*, *66*, 95-100.

Coates, J. (2011). Physically fit or physically literate? How children with special educational needs understand physical education. *European Physical Education Review, 17*(2), 167-181.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155-159.

Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: International survey. *BMJ*, *320*(7244), 1-6.

Colley, R. C., Carson, V., Garriguet, D., Janssen, I., Roberts, K. C., & Tremblay, M. S. (2017). Physical activity of Canadian children and youth, 2007 to 2015. *Health Reports*, *28*(10), 8-16.

Corbin, C. B. (2016). Implications of physical literacy for research and practice: A commentary. *Research Quarterly for Exercise and Sport*, *87*(1), 14-27.

Demetriou, Y., Sudeck, G., Thiel, A., & Höner, O. (2015). The effects of school-based physical activity interventions on students' health-related fitness knowledge: A systematic review. *Educational Research Review*, *16*, 19-40.

Descartes, R. (1641). *The Philosophical Works of Descartes*. Cambridge: CUP.

Dewey, J. (1938). *Experience and Education,* New York: Simon and Schuster.

Ding, D., Lawson, K. D., Kolbe-Alexander, T. L., Finkelstein, E. A., Katzmarzyk, P. T., van Mechelen, W., ... & Lancet Physical Activity Series 2 Executive Committee. (2016). The economic burden of physical inactivity: A global analysis of major non-communicable diseases. *The Lancet*, *388*(10051), 1311-1324.

Dudley, D., Cairney, J., Wainwright, N., Kriellaars, D., & Mitchell, D. (2017). Critical considerations for physical literacy policy in public health, recreation, sport, and education agencies. *Quest*, *69*(4), 436-452.

Dudley, D., Kriellaars, D., & Cairney, J. (2016). Physical literacy assessment and its potential for identification and treatment of children with neuro-developmental behavioral intellectual disorders. *Current Developmental Disorders Reports, 3*(3), 195-199.

Dumith, S. C., Gigante, D. P., Domingues, M. R., & Kohl III, H. W. (2011). Physical activity change during adolescence: A systematic review and a pooled analysis. *International Journal of Epidemiology*, *40*(3), 685-698.

Durden-Myers, E. J., & Whitehead, M. E. (2018). Operationalizing physical literacy: Special issue editorial. *Journal of Teaching in Physical Education*, *37*(3), 234-236.

Durden-Myers, E. J., Whitehead, M. E., & Pot, N. (2018). Physical literacy and human flourishing. *Journal of Teaching in Physical Education*, *37*(3), 308-311.

Durden-Myers, E. J., Green, N. R., & Whitehead, M. E. (2018). Implications for Promoting Physical Literacy. *Journal of Teaching in Physical Education*, *37*(3), 262-271.

Edwards, L. C., Bryant, A. S., Keegan, R. J., Morgan, K., & Jones, A. M. (2017). Definitions, foundations and associations of physical literacy: A systematic review. *Sports Medicine*, *47*(1), 113-126.

Ennis, C. D. (2011). Physical education curriculum priorities: Evidence for education and skillfulness. *Quest*, *63*(1), 5-18.

Ennis, C. D. (2015). Knowledge, transfer, and innovation in physical literacy curricula. *Journal of Sport and Health Science*, *4*(2), 119-124.

Erwin, H., Beighle, A., Carson, R. L., & Castelli, D. M. (2013). Comprehensive school-based physical activity promotion: A review. *Quest*, *65*(4), 412-428.

Ever Active Schools. (2014). Who we are. Retrieved from https://everactive.org/who-we-are/.

Field, A. (2013). Multilevel linear models. In *Discovering statistics using IBM SPSS statistics* (pp. 814- 866). London: Sage.

Francis, C. E., Longmuir, P. E., Boyer, C., Andersen, L. B., Barnes, J. D., Boiarskaia, E., ... & Hay, J. A. (2016). The Canadian Assessment of Physical Literacy: Development of a model of children's capacity for a healthy, active lifestyle through a Delphi process. *Journal of Physical Activity & Health*, *13*(2), 214-222.

Fung, C., Kuhle, S., Lu, C., Purcell, M., Schwartz, M., Storey, K., & Veugelers, P. J. (2012). From" best practice" to" next practice": The effectiveness of school-based health promotion in improving healthy eating and physical activity and preventing childhood obesity. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 27.

Giblin, S., Collins, D., & Button, C. (2014). Physical literacy: Importance, assessment, and future directions. *Sports Medicine*, *44*(9), 1177-1184.

Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, *31*, 399-418.

Gourlan, M., Bernard, P., Bortolon, C., Romain, A. J., Lareyre, O., Carayol, M., ... & Boiché, J. (2016). Efficacy of theory-based interventions to promote physical activity. A meta-analysis of randomised controlled trials. *Health Psychology Review*, *10*(1), 50-66.

Green, N. R., Roberts, W. M., Sheehan, D., & Keegan, R. J. (2018). Charting physical literacy journeys within physical education settings. *Journal of Teaching in Physical Education*, *37*(3), 272-279.

Gunnell, K. E., Longmuir, P. E., Barnes, J. D., Bélanger, K., & Tremblay, M. S. (2018). Refining the Canadian Assessment of Physical Literacy based on theory and factor analyses. *BMC Public Health*, *18*(2), 1044.

Hall, P. A., & Fong, G. T. (2007). Temporal self-regulation theory: A model for individual health behavior. *Health Psychology Review*, *1*(1), 6-52.

Harris, P.A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde J.G. (2009). Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, *42*(2), 377-381.

Hastie, P. A., & Wallhead, T. L. (2015). Operationalizing physical literacy through sport education. *Journal of Sport and Health Science*, *4*(2), 132-138.

Hayes, A. F. (2006). A primer on multilevel modeling. *Human Communication Research*, *32*(4), 385-410.

Healthy Active Living and Obesity Research Group. (2013). *Canadian Assessment of Physical Literacy, CAPL Manual.* Retrieved from https://www.capl-ecsfp.ca/capl-manual/

Heck, R. H., Thomas, S. L., & Tabata, L. N. (2014). *Multilevel and longitudinal modeling with IBM SPSS*. New York, NY: Routledge.

Hills, A. P., Dengel, D. R., & Lubans, D. R. (2015). Supporting public health priorities: Recommendations for physical education and physical activity promotion in schools. *Progress in Cardiovascular Diseases*, *57*(4), 368-374.

Hill, S., & Gracia, L. (2006). Physical literacy and learning. *International Journal of Learning*, *12*(9).

Hobbs, M., Daly-Smith, A., McKenna, J., Quarmby, T., & Morley, D. (2017). Reconsidering current objectives for physical activity within physical education. *British Journal of Sports Medicine*, *52*(19), 1-2.

Hopsicker, P. (2009). Polanyi's "From-To" knowing and his contribution to the phenomenology of skilled motor behavior. *Journal of the Philosophy of Sport*, *36*(1), 76-87.

Humphries, C. A., Hebert, E., Daigle, K., & Martin, J. (2012). Development of a physical education teaching efficacy scale. *Measurement in Physical Education and Exercise Science*, *16*(4), 284-299.

Hung, T. T. M., Chiang, V. C. L., Dawson, A., & Lee, R. L. T. (2014). Understanding of factors that enable health promoters in implementing health-promoting schools: A systematic review and narrative synthesis of qualitative evidence. *PloS One*, *9*(9), e108284.

Hyndman, B., & Pill, S. (2017). What's in a concept? A Leximancer text mining analysis of physical literacy across the international literature. *European Physical Education Review*, 1356336X17690312.

International Physical Literacy Association. International Physical Literacy Association homepage. Plymouth: International Physical Literacy Association; 2016. URL: www.physical-literacy.org.uk.

International Physical Literacy Association. (2015). Canada's Physical Literacy Consensus Statement. Retrieved from http://www.participaction.com/canadas-physical-literacy-consensus-statement.

Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly*, *11*(1), 1-47.

Jenkinson, K. A., & Benson, A. C. (2010). Barriers to providing physical education and physical activity in Victorian state secondary schools. *Australian Journal of Teacher Education*, *35*(8), 1-17.

Jurbala, P. (2015). What is physical literacy, really? *Quest, 67*(4), 367-383.

Kelloway, E. K. (2015). *Using Mplus for structural equation modeling: A researcher's guide*. Sage Publications, Inc.

Kelly, P., Fitzsimons, C., & Baker, G. (2016). Should we reframe how we think about physical activity and sedentary behaviour measurement? Validity and reliability reconsidered. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1), 32.

Keske, G., Gursel, F., & Alagul, O. (2012). Can you gain a healthy nutrition habit by physical literacy? *Procedia - Social and Behavioral Sciences, 47*, 1097-1102.

Kern, B. D., & Graber, K. C. (2017). Physical education teacher change: Initial validation of the Teacher Change Questionnaire-Physical Education. *Measurement in Physical Education and Exercise Science*, 1-13.

Kipping, R. R., Howe, L. D., Jago, R., Campbell, R., Wells, S., Chittleborough, C. R., ... & Lawlor, D. A. (2014). Effect of intervention aimed at increasing physical activity, reducing sedentary behaviour, and increasing fruit and vegetable consumption in children: Active for Life Year 5 (AFLY5) school based cluster randomised controlled trial. *BMJ*, *348*, g3256.

Kriellaars, D. (2013). *Physical Literacy Assessment for Youth, What is PLAY?* Retrieved from http://play.physicalliteracy.ca/what-play.

Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic Books.

Lander, N., Eather, N., Morgan, P. J., Salmon, J., & Barnett, L. M. (2017). Characteristics of teacher training in school-based physical education interventions to improve fundamental movement skills and/or physical activity: A systematic review. *Sports Medicine*, *47*(1), 135-161.

Langford, R., Bonell, C., Jones, H., & Campbell, R. (2015). Obesity prevention and the Health Promoting Schools framework: Essential components and barriers to success. *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 15.

Langford, R., Campbell, R., Magnus, D., Bonell, C. P., Murphy, S. M., Waters, E., ... & Gibbs, L. F. (2011). The WHO Health Promoting School framework for improving the health and well-being of students and staff. *Cochrane Database Systematic Reviews* 2011, Issue 1.

Langille, J. L. D., & Rodgers, W. M. (2010). Exploring the influence of a social ecological model on school-based physical activity. *Health Education & Behavior*, *37*(6), 879-894.

Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., & Lancet Physical Activity Series Working Group. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet*, *380*(9838), 219-229.

Li, K. K. (2013). Domain dimensionality and temporality of outcome expectancy for physical activity among middle-aged and older Chinese adults: A latent profile analysis. *Psychology of Sport and Exercise*, *14*(5), 682-691.

Lizotte, C., Larouche, R., LeBlanc, A. G., Longmuir, P. E., Tremblay, M. S., & Chaput, J. P. (2016). Investigation of new correlates of physical literacy in children. *Health Behavior and Policy Review*, *3*(2), 110-122.

Lloyd, M., Colley, R. C., & Tremblay, M. S. (2010). Advancing the debate on 'fitness testing' for children: Perhaps we're riding the wrong animal. *Pediatric Exercise Science*, *22*(2), 176-182.

Longmuir, P. E., Boyer, C., Lloyd, M., Borghese, M. M., Knight, E., Saunders, T. J., ... & Tremblay, M. S. (2015a). Canadian Agility and Movement Skill Assessment (CAMSA): Validity, objectivity, and reliability evidence for children 8–12 years of age. *Journal of Sport and Health Science*, 6(2), 231-240.

Longmuir, P. E., Boyer, C., Lloyd, M., Yang, Y., Boiarskaia, E., Zhu, W., & Tremblay, M. S. (2015b). The Canadian Assessment of Physical Literacy: Methods for children in grades 4 to 6 (8 to 12 years). *BMC Public Health*, *15*(1), 1.

Longmuir, P. E., & Tremblay, M. S. (2016). Top 10 research questions related to physical literacy. *Research Quarterly for Exercise and Sport*, *87*(1), 28-35.

Longmuir, P. E., Gunnell, K. E., Barnes, J. D., Bélanger, K., Leduc, G., Woodruff, S. J., & Tremblay, M. S. (2018). Canadian Assessment of Physical Literacy Second Edition: A streamlined assessment of the capacity for physical activity among children 8 to 12 years of age. *BMC Public Health*, *18*(2), 1047.

Lounsbery, M. A., & McKenzie, T. L. (2015). Physically literate and physically educated: A rose by any other name? *Journal of Sport and Health Science*, *4*(2), 139-144.

Lumpe, A., Vaughn, A., Henrikson, R., & Bishop, D. (2014). Teacher professional development and self-efficacy beliefs. In *The Role of Science Teachers' Beliefs in International Classrooms* (pp. 49-63). SensePublishers.

Lundvall, S. (2015). Physical literacy in the field of physical education–A challenge and a possibility. *Journal of Sport and Health Science*, *4*(2), 113-118.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, *1*(2), 130.

Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology*, *19*(5), 469-479.

Maddux, J. E., Norton, L. W., & Stoltenberg, C. D. (1986). Self-efficacy expectancy, outcome expectancy, and outcome value: Relative effects on behavioral intentions. *Journal of Personality and Social Psychology*, *51*(4), 783-789.

Magnusson, K. T., Sigurgeirsson, I., Sveinsson, T., & Johannsson, E. (2011). Assessment of a two-year school-based physical activity intervention among 7-9-year-old children. *International Journal of Behavioral Nutrition and Physical Activity*, *8*(1), 138.

Mandigo, J., Francis, N., Lodewyk, K., & Lopez, R. (2009). Physical literacy for educators. *Physical & Health Education Journal, 75*(3), 27-30.

Martin, J. J., Mccaughtry, N., Hodges-Kulinna, P., & Cothran, D. (2008). The influences of professional development on teachers' self-efficacy toward educational change. *Physical Education and Sport Pedagogy*, *13*(2), 171-190.

McCaffery, M., & Singleton, E. (2013). Why are we doing this anyway? Physical literacy, monism, and perceived physical competence for Ontario's elementary students. *Physical & Health Education Journal, 79*(3), 6-12.

Moseley, C., Reinke, K., & Bookout, V. (2002). The effect of teaching outdoor environmental education on preservice teachers' attitudes toward self-efficacy and outcome expectancy. *The Journal of Environmental Education*, *34*(1), 9-15.

Murray, N. G., Low, B. J., Hollis, C., Cross, A. W., & Davis, S. M. (2007). Coordinated school health programs and academic achievement: A systematic review of the literature. *Journal of School Health*, *77*(9), 589-600.

Nie, Y., Lau, S., & Liau, A. (2012). The teacher efficacy scale: A reliability and validity study. *The Asia-Pacific Education Researcher,* 21(2), 414-421.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., ... & Abraham, J. P. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, *384*(9945), 766-781.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*(4), 543-578.

ParticipACTION. (2016). Are Canadian kids too tired to move? The 2016 ParticipACTION Report Card on Physical Activity for Children and Youth. Retrieved from https://www.participaction.com/en-ca/thought-leadership/report-card/2016.

ParticipACTION, (2018). The brain+ body equation: Canadian kids need active bodies to build their best brains. The 2018 ParticipACTION Report Card on Physical Activity for Children and Youth. Retrieved from https://www.participaction.com/en-ca/resources/report-card.

Physical Health and Education Canada. (2013). *What is Passport for Life?* Retrieved from http://passportforlife.ca/what-is-passport-for-life.

Poitras, V. J., Gray, C. E., Borghese, M. M., Carson, V., Chaput, J.-P., Janssen, I., . . . Kho, M. E. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism, 41*(6), S197-S239.

Pot, N., Whitehead, M. E., & Durden-Myers, E. J. (2018). Physical literacy from philosophy to practice. *Journal of Teaching in Physical Education*, *37*(3), 246-251.

Prestwich, A., Sniehotta, F. F., Whittington, C., Dombrowski, S. U., Rogers, L., & Michie, S. (2014). Does theory influence the effectiveness of health behavior interventions? Meta-analysis. *Health Psychology*, *33*(5), 465-474.

Prochaska, J. O., & DiClemente, C. C. (1984). *The transtheoretical approach: Crossing traditional boundaries of therapy*. Dow Jones-Irwin.2013b

Reilly, J. J. (2016). When does it all go wrong? Longitudinal studies of changes in moderate-to-vigorous-intensity physical activity across childhood and adolescence. *Journal of Exercise Science & Fitness*, *14*(1), 1-6.

Reis, R. S., Salvo, D., Ogilvie, D., Lambert, E. V., Goenka, S., Brownson, R. C., & Lancet Physical Activity Series 2 Executive Committee. (2016). Scaling up physical activity interventions worldwide: Stepping up to larger and smarter approaches to get people moving. *The Lancet*, *388*(10051), 1337-1348.

Rhodes, R. E., McEwan, D., & Rebar, A. L. (in press). Theories of physical activity behaviour change: A history and synthesis of approaches. *Psychology of Sport and Exercise*.

Rigdon, E. E. (1994). Calculating degrees of freedom for a structural equation model. *Structural Equation Modeling: A Multidisciplinary Journal*, *1*(3), 274-278.

Robinson, D. B., & Randall, L. (2017). Marking physical literacy or missing the mark on physical literacy? A conceptual critique of Canada's Physical Literacy Assessment Instruments. *Measurement in Physical Education and Exercise Science*, *21*(1), 40-55.

Robinson, D. B., Randall, L., & Barrett, J. (2018). Physical literacy (mis) understandings: What do leading physical education teachers know about physical literacy?. *Journal of Teaching in Physical Education*, *37*(3), 288-298.

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, *91*(1), 93-114.

Rodgers, W. M., & Brawley, L. R. (1996). The influence of outcome expectancy and self-efficacy on the behavioral intentions of novice exercisers. *Journal of Applied Social Psychology*, *26*(7), 618-634.

Rodgers, W. M., & Gauvin, L. (1998). Heterogeneity of incentives for physical activity and self-efficacy in highly active and moderately active women exercisers. *Journal of Applied Social Psychology*, *28*(11), 1016-1029.

Roetert, E. P., & Jefferies, S. C. (2014). Embracing physical literacy. *Journal of Physical Education, Recreation and Dance*, *85*(8), 38-40.

Roetert, E. P., Kriellaars, D., Ellenbecker, T. S., & Richardson, C. (2017). Preparing students for a physically literate life. *Journal of Physical Education, Recreation & Dance*, *88*(1), 57-62.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, *15*(2), 175-183.

Sallis, J. F., Owen, N., & Fotheringham, M. J. (2000). Behavioral epidemiology: A systematic framework to classify phases of research on health promotion and disease prevention. *Annals of Behavioral Medicine*, *22*(4), 294-298.

Sallis, J. F., & McKenzie, T. L. (1991). Physical education's role in public health. *Research Quarterly for Exercise and Sport*, *62*(2), 124-137.

Sallis, J. F., McKenzie, T. L., Beets, M. W., Beighle, A., & Erwin, H. & Lee, S. (2012). Physical education's role in public health: Steps forward and backward over 20 years and HOPE for the future. *Research Quarterly for Exercise and Sport*, 83-125.

Samdal, O., & Rowling, L. (2011). Theoretical and empirical base for implementation components of health-promoting schools. *Health Education*, *111*(5), 367-390.

Satorra, A., & Bentler, P. M. (2010). Ensuring positiveness of the scaled difference chi-square test statistic. *Psychometrika*, *75*(2), 243-248.

Saunders, T. J., MacDonald, D. J., Copeland, J. L., Longmuir, P. E., Barnes, J. D., Bélanger, K., ... & Law, B. (2018). The relationship between sedentary behaviour and physical literacy in Canadian children: A cross-sectional analysis from the RBC-CAPL Learn to Play study. *BMC Public Health*, *18*(2), 1037.

Shearer, C., Goss, H. R., Edwards, L. C., Keegan, R. J., Knowles, Z. R., Boddy, L. M., ... & Foweather, L. (2018). How is physical literacy defined? A contemporary update. *Journal of Teaching in Physical Education*, *37*(3), 237-245.

Scherer, R., Jansen, M., Nilsen, T., Areepattamannil, S., & Marsh, H. W. (2016). The quest for comparability: Studying the invariance of the teachers' sense of self-efficacy (TSES) measure across countries. *PloS One*, *11*(3), e0150829.

Sheehan, D., & Kats, L. (2010). Using interactive fitness and exergames to develop physical literacy. *Physical & Health Education Journal*, *76*(1), 12-19.

Sheets-Johnstone, M. (1999). *The primacy of movement*. Philadelphia, PA: John Benjamins Publishing Company.

Shusterman, R. (1997). Practicing philosophy: Pragmatism and the philosophical life. New York: Routledge.

Shusterman, R. (2004). Somaesthetics and education: Exploring the terrain. In Bresler, L. (ed.) *Knowing bodies, Moving minds.* Netherlands: Kluwer Academic publishers.

Shusterman, R. (2008) *Body consciousness—A philosophy of mindfulness and somaesthetics.* Cambridge: Cambridge University Press.

Spence, J. C., & Lee, R. E. (2003). Toward a comprehensive model of physical activity. *Psychology of Sport and Exercise*, *4*(1), 7-24.

Spengler, J. O., & Cohen, J. (2015). *Physical literacy: A global environmental scan*. Washington, DC: The Aspen Institute.

Stearns, J. A., Wohlers, B., McHugh, T. L. F., Kuzik, N., & Spence, J. C. (2018). Reliability and Validity of the PLAY fun Tool with Children and Youth in Northern Canada. *Measurement in Physical Education and Exercise Science*, 1-11.

Stewart-Brown. (2006). *What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach?* Copenhagen, WHO Regional Office for Europe.

Stevens-Smith, D. A. (2016). Physical literacy: getting kids active for life. *Strategies*, *29*(5), 3-9.

St. Leger, L. (1998). Australian teachers' understandings of the health promoting school concept and the implications for the development of school health. *Health Promotion International*, *13*(3), 223-235.

St. Leger, L. (2000). Reducing the barriers to the expansion of health-promoting schools by focusing on teachers. *Health Education*, *100*(2), 81-87.

Stoddart, A. L., & Humbert, M. L. (2017). Physical literacy is...? What teachers really know. *Revue phénEPS/PHEnex Journal*, *8*(3).

Storey, K. E., Cunningham, C., Spitters, H., Schwartz, M., & Veugelers, P. J. (2012). The sustainability of APPLE Schools: Teachers' perceptions. *Physical & Health Education Journal*, *78*(3), 16-22.

Storey, K. E., Montemurro, G., Flynn, J., Schwartz, M., Wright, E., Osler, J., ... & Roberts, E. (2016). Essential conditions for the implementation of comprehensive school health to achieve changes in school culture and improvements in health behaviours of students. *BMC Public Health*, *16*(1).

Sum, R. K. W., Ha, A. S. C., Cheng, C. F., Chung, P. K., Yiu, K. T. C., Kuo, C. C., Yu, C.K., & Wang, F. J. (2016). Construction and validation of a Perceived Physical Literacy Instrument for physical education teachers. *PloS One*, *11*(5), e0155610.

Svozil, Z., Frömel, K., Chmelík, F., Jakubec, L., Groffik, D., & Safár, M. (2015). Mental load and its compensation by physical activity in adolescents at secondary schools. *Central European Journal of Public Health*, *23*, S44.

Taylor, S. L., Noonan, R. J., Knowles, Z. R., Owen, M. B., & Fairclough, S. J. (2018). Process evaluation of a pilot multi-component physical activity intervention–active schools: Skelmersdale. *BMC Public Health*, *18*(1), 1383.

Terwee, C. B., Bot, S. D., de Boer, M. R., van der Windt, D. A., Knol, D. L., Dekker, J., ... & de Vet, H. C. (2007). Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of Clinical Epidemiology*, 60(1), 34-42.

Tjomsland, H. E., Iversen, A. C., & Wold, B. (2009). The Norwegian network of health promoting schools: A three-year follow-up study of teacher motivation, participation and perceived outcomes. *Scandinavian Journal of Educational Research*, *53*(1), 89-102.

Tompsett, C., Burkett, B., & McKean, M. R. (2013). Development of physical literacy and movement competency: A literature review. *Journal of Fitness Research*, *3*(2), 53-74.

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, *68*(2), 202-248.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, *17*(7), 783-805.

Tremblay, M. S., Aubert, S., Barnes, J. D., Saunders, T. J., Carson, V., Latimer-Cheung, A. E., ... & Chinapaw, M. J. (2017). Sedentary behavior research network (SBRN) – Terminology consensus project process and outcome. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 75.

Tremblay, M. S., Carson, V., Chaput, J. P., Connor Gorber, S., Dinh, T., Duggan, M., ... & Janssen, I. (2016). Canadian 24-hour movement guidelines for children and youth: An integration of physical activity, sedentary behaviour, and sleep. *Applied Physiology, Nutrition, and Metabolism*, *41*(6), S311-S327.

Tremblay, M. S., Costas-Bradstreet, C., Barnes, J. D., Bartlett, B., Dampier, D., Lalonde, C., ... & Way, R. (2018). Canada's physical literacy consensus statement: Process and outcome. *BMC Public Health*, *18*(2), 1034.

Tremblay, M. S., & Longmuir, P. E. (2017). Conceptual critique of Canada's physical literacy assessment instruments also misses the mark. *Measurement in Physical Education and Exercise Science*, 21(3), 1-3.

Tremblay, M., & Lloyd, M. (2010). Physical literacy measurement: The missing piece. *Physical & Health Education Journal*, *76*(1), 26-30.

Trochim, W., & Donnelly, J. P. (2008). *Research methods knowledge base*. Mason, OH: Atomic Dog.

United Nations Educational Scientific and Cultural Organization. (2015). *Quality physical education (QPE): Guidelines for Policy Makers*. Retrieved from http://unesdoc.unesco.org/images/0023/002311/231101E.pdf.

Veugelers, P. J., & Fitzgerald, A. L. (2005). Effectiveness of school programs in preventing childhood obesity: A multilevel comparison. *American Journal of Public Health*, *95*(3), 432-435.

Veugelers, P. J., & Schwartz, M. E. (2010). Comprehensive school health in Canada. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique*, 101(2), S5-S8.

Wake, M. (2018). The failure of anti-obesity programmes in schools. *BMJ, 360*: k507.

Weatherson, K. A., Gainforth, H. L., & Jung, M. E. (2017). A theoretical analysis of the barriers and facilitators to the implementation of school-based physical activity policies in Canada: A mixed methods scoping review. *Implementation Science*, *12*(41), 1-15.

Webster, C. A., Monsma, E., & Erwin, H. (2010). The role of biographical characteristics in preservice classroom teachers' school physical activity promotion attitudes. *Journal of Teaching in Physical Education*, *29*(4), 358-377.

Webster, C. A., Webster, L., Russ, L., Molina, S., Lee, H., & Cribbs, J. (2015). A systematic review of public health-aligned recommendations for preparing physical education teacher candidates. *Research Quarterly for Exercise and Sport*, *86*(1), 30-39.

Whitehead, M. (1990). Meaningful existence, embodiment and physical education. *Journal of Philosophy of Education*, *24*(1), 3-14.

Whitehead 1, M. (2001). The concept of physical literacy. *European Journal of Physical Education, 6*(2), 127-138.

Whitehead, M. (2007). Physical literacy: Philosophical considerations in relation to developing a sense of self, universality and propositional knowledge. *Sport, Ethics and Philosophy, 1*(3), 281-298.

Whitehead, M. (2009). Physical literacy: The way ahead. *Physical Education Matters, 4*(4), 20-21.

Whitehead M. (2010). *Physical literacy throughout the lifecourse*. London: Routledge Taylor & Francis Group.

Whitehead, M. (2013a). The history and development of physical literacy. *ICSSPE Bulletin - Journal of Sport Science and Physical Education, 65*, pp. 21-27.

Whitehead, M. (2013b). Definition of Physical Literacy and clarification of related issues. *ICSSPE Bulletin - Journal of Sport Science and Physical Education, 65*(1.2), 28-33.

Whitehead, M. (2016). Definition of physical literacy. International Physical Literacy Association homepage. Retrieved from: www.physical-literacy.org.uk.

Whitehead, M. E., Durden-Myers, E. J., & Pot, N. (2018). The value of fostering physical literacy. *Journal of Teaching in Physical Education*, *37*(3), 252-261.

Williams, D. M., Anderson, E. S., & Winett, R. A. (2005). A review of the outcome expectancy construct in physical activity research. *Annals of Behavioral Medicine*, *29*(1), 70-79.

Williams, D. M. (2010). Outcome expectancy and self-efficacy: Theoretical implications of an unresolved contradiction. *Personality and Social Psychology Review*, *14*(4), 417-425.

Williams, D. M., & Rhodes, R. E. (2016). The confounded self-efficacy construct: Conceptual analysis and recommendations for future research. *Health Psychology Review*, *10*(2), 113-128.

Wójcicki, T. R., White, S. M., & McAuley, E. (2009). Assessing outcome expectations in older adults: The multidimensional outcome expectations for exercise scale. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *64*(1), 33-40.

World Health Organization. (1986). Ottawa charter for health promotion. *Health Promotion*, *1*, iii-v.

Young, M. D., Plotnikoff, R. C., Collins, C. E., Callister, R., & Morgan, P. J. (2014). Social cognitive theory and physical activity: A systematic review and meta-analysis. *Obesity Reviews*, *15*(12), 983-995.

Appendix A: Tables

Table 1

Literature Review of Teacher Outcome Expectancies in School-based Physical Activity Promotion Interventions

Author(s), year	Study design	Country of origin	Sample	Intervention focus	Results
Cale, Harris, & Duncombe, 2016	Mixed Methods	United Kingdom	Survey: -603 Schools -603 Teachers Interviews: -17 teachers	Physical Activity Promotion in Secondary Schools	Teacher OE -support of staff -support of administration -time constraints -student physical activity levels
Jenkinson & Benson, 2010	Cross-Sectional, Quantitative	Australia	Survey: -115 Teachers	Physical Education and Physical Activity In Secondary Schools	Barriers to delivery of PE and PA -lack of time -staff support -administrative support -other teaching priorities -inhibit school scheduling -difficulty in providing safe and structured lessons -colleagues undervaluing activity -student engagement -student's peer support -student affective perception of PE

					-a crowded curriculum
Magnusson, Sigurgeirsson, Sveinsson, & Johannsson, 2011	Longitudinal, Mixed Methods	Iceland	Six Schools: -3 Control, 3 Intervention Interviews: -11 Teachers	Physical Activity Intervention	Benefits of implementation -positive attitude toward PA -increased PA during school hours -changed attitude about PA among teachers -calmness in class post-activity -positive effect on student productivity -more unity in class -increased readiness of students towards PA -increased willingness to try new sports Facilitators -positive attitude of principal -good collaboration with colleagues -positive attitudes of teachers Barriers to Implementation -competing curricular demands -Icelandic winter weather -steep learning curve for teachers -tightly booked PA spaces

Lander, Eather, Morgan, Salmon, & Barnett, 2017	Systematic Review	International	Systematic Review: -39 articles	Fundamental Movements Skills and/or Physical Activity	Teacher Satisfaction -content relevant to their beliefs -program needs to be thought-provoking for their practice -alignment with student learning outcomes
Weatherson, Gainforth, & Jung, 2017	Mixed Methods Scoping Review	Canada	Scoping Review: -15 articles	Daily Physical Activity	Beliefs about Consequences -increased workload -increased teacher stress -safety concerns for students -child enjoyment/fun -leadership opportunities for students -increased student focus/attention -improves overall environment -curriculum demands

Note. PA = Physical Activity, OE = Outcome Expectations, PE = Physical Education.

Table 2

Original Physical Literacy Outcome Expectancy Item Stems for the Outcome Expectancy Scale

Physical outcome expectations	Social outcome expectations	Self-evaluative outcome expectations
1. Intentionally adding the concept of physical literacy to my lessons will increase the quality of my lessons.	**11. Sharing the idea of physical literacy with my fellow teachers will make me look like a competent educator.**	23. Intentionally including physical literacy in lessons will help my students be more active in the short-term.
2. Intentionally adding the concept of physical literacy to my lessons will decrease the quality of my lessons.	12. Sharing the idea of physical literacy with my fellow teachers will make me look like an incompetent educator.	24. Intentionally including physical literacy in my lessons will prevent my students from being more active in the short-term.
	13. Discussing physical literacy with my peers will make me look like I am up-to-date with the current teaching trends.	25. Intentionally including physical literacy in my lessons will significantly increase my student's physical activity levels.
3. Including physical literacy in my day-to-day will conflict with other curricular demands.		26. Intentionally including physical literacy in my lessons will not significantly change my student's physical activity levels.
4. Including physical literacy in my day-to-day will add more to my already busy schedule.	14. Discussing physical literacy with my peers will make it look like I am buying into the latest teaching buzz word.	**27. Purposefully including physical literacy in my lessons will make me feel better about the effects of my teaching.**
		28. Purposefully including physical literacy in my lessons will make me feel like the effects of my teaching are poorer than normal.
5. Incorporating physical literacy into my classroom content will enhance the delivery of other outcomes.	15. If I incorporate physical literacy into my lesson planning my colleagues will approve.	29. If I consciously include the concept of physical literacy in my day-to-day interactions with students I will be making a positive influence in their life.
6. Incorporating physical literacy into my classroom content will take time away from other outcomes.	16. If I incorporate physical literacy into my lesson planning my colleagues will disapprove.	30. If I consciously include the concept of physical literacy in my day-to-day interactions with students I will be making a negative influence in their life.
		31. Deliberately including physical literacy concepts in my lessons will make me feel like a capable teachers.
7. By intentionally using physical literacy it will be easier to meet curricular requirements.	17. If I include physical literacy in all aspects of my work then the social environment of my school will be more fun.	32. Deliberately including physical literacy concepts in my lessons will make me feel less capable in my teaching.
8. By intentionally using physical literacy it will be	18. If I include physical literacy in all aspects of my work then the social environment of my school will be less fun.	**33. If I include physical literacy in my pedagogy I will be more satisfied with my teaching.**
		34. If I include physical literacy in my pedagogy I will be less satisfied with my teaching.

more difficult to meet curricular requirements.

9. Including physical literacy in my teaching will lessen my daily work-load.
10. **Including physical literacy in my teaching will add on to an already heavy work-load.**

19. By including physical literacy in my teaching I will be more able to collaborate with my fellow teachers.
20. By including physical literacy in my teaching I will be less able to collaborate with my fellow teachers.
21. **Working with physical literacy in my classrooms will earn me the support of my school administration.**
22. Working with physical literacy will not earn the support of my school administration.

35. Intentionally adding physical literacy concepts to my teaching will improve the relevancy of my class content to my students.
36. Intentionally adding physical literacy concepts to my teaching will reduce the relevancy of my class content for my students.
37. Adding physical literacy to my teaching will make my students value the class content less.
38. Adding physical literacy to my teaching will make my students value the class content more.
39. Teaching using physical literacy will make my work-day more stressful.
40. **Teaching using physical literacy will make my work-day less stressful.**
41. Intentionally adding physical literacy to my class pedagogy will aid child learning.
42. Intentionally adding physical literacy to my classroom pedagogy will inhibit child learning.
43. Teaching with physical literacy in mind will increase my student's enjoyment of my class.
44. Teaching with physical literacy in mind will lessen my student's enjoyment of my class.
45. **Teaching with physical literacy in mind will improve the quality of my class' overall environment.**
46. Teaching with physical literacy in mind will diminish the quality of my class' overall environment.
47. **Physical literacy will make my class content more relevant for my students.**
48. Physical literacy will make my class content less relevant for my students.

Note. Outcome Expectations stems were included in a positive and negative form, as per recommendations of (Williams & Rhodes, 2016; Williams et al., 2005; Williams, 2010). Bolded text indicates final inclusion in the survey.

Table 3

Intraclass Correlation Coefficients of the Self-Efficacy and Outcome Expectancy Scales for Fostering Physical Literacy

Belief measure	N (mean cluster size)	ICC as %
Instructional strategies self–efficacy	186 (4.78)	**7.3%**
Classroom management self-efficacy	187 (4.80)	2.0%
Student engagement self-efficacy	187 (4.77)	**10.6%**
Total physical literacy self-efficacy	187 (4.80)	**7.3%**
Likelihood of outcomes	163 (4.29)	**11.5%**
Value of outcomes	162 (4.26)	**11.4%**
Temporal proximity of outcomes	129 (3.68)	3.5%

Note. Bolded text indicates ICC > 5%; ICC = Intraclass Correlation Coefficent.

Table 4

Confirmatory Factor Analysis Fit Indices for the Belief Scales for Fostering Physical Literacy in Youth for all Educators

Model	χ^2	df	RMSEA	CFI	TLI	SRMR	SCF MLR
Modified TSES							
One factor	165.80***	54	.105	.880	.854	.051	1.44
Three factor	84.77***	41	.076	.950	.933	.041	1.28
Likelihood OE Scale							
One factor	53.35**	27	.074	.955	.939	.039	1.47
Two factor	49.19**	26	.071	.960	.945	.036	1.42
Value OE Scale							
One factor	90.22***	27	0.116	.888	.851	.052	1.52
Two factor	82.57***	26	.112	.90	.862	.049	1.47
Temporal Proximity OE Scale							
One factor	67.42***	27	.099	.93	.906	.040	1.78
Two factor	70.55***	26	.105	.923	.893	.039	1.66

Note. *$p < .05$; **$p < .01$, *** $p < .001$; TSES = Teacher Self-Efficacy Scale, OE = Outcome Expectations, df = degrees of freedom, RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standardized Root Mean Square Residual, SCF MLR = Scaled Correction Factors for Maximum Likelihood Robust.

Table 5

Internal Consistency of the Self-Efficacy and Outcome Expectation Measures for Fostering Physical Literacy

Belief measure	*n*	α
Student engagement self-efficacy	187	.897
Instructional strategies self-efficacy	178	.851
Classroom management self-efficacy	186	.856
Modified TSES	178	.931
Likelihood of outcomes	109	.942
Value of outcomes	113	.941
Temporal proximity of outcomes	83	.973

Note. Scores are interpreted as: good = .70 - .89, excellent ≥ .90; TSES = Teacher Self-Efficacy Scale.

Table 6

Demographic Information for the Educators

Demographic measure	PLR educators – n = 129 (%)	Comparison educators – n = 90 (%)
Gender		
Female	108* (49.3%)	61* (70.1%)
Male	18* (8.6%)	25* (11.4%)
School geography		
Urban	13 (41.9%)	2 (22.2%)
Rural	18 (58.1%)	7 (77.8%)
Teacher geography		
Urban	60* (47.6%)	23* (26.4%)
Rural	66* (52.4%)	64* (73.6%)
Physical education training		
Yes	20 (15.9%)	19 (21.8%)
No	106 (84.1%)	68 (78.2%)
Years of teaching experience		
0 to 5 years	31 (24.6%)	32 (36.8%)
6 to 10 years	30 (23.8%)	7 (8.0%)
11 to 15 years	16 (12.7%)	14 (16.1%)
16 to 20 years	21 (16.7%)	12 (13.8%)
20+ years	28 (22.2%)	22 (25.3%)

Note. *$p < .05$; **$p < .01$, *** $p < .001$; PLR = Physical Literacy in Residence.

Table 7

Means and Standard Deviations of the Educator's Beliefs for Fostering Physical Literacy in Youth

Belief measure (scale range)	PLR educators	Comparison educators	Overall
Engagement efficacy (1 – 9)	6.77 (1.39)	6.20 (1.24)	6.53 (1.36)
Instructional efficacy (1 – 9)	6.66 (1.31)	6.36 (1.22)	6.53 (1.27)
Classroom management (1 – 9)	6.50 (1.37)	5.98 (1.17)	6.28 (1.31)
TSES for physical literacy (1 – 9)	6.62 (1.31)	6.18 (1.13)	6.44 (1.25)
Likelihood of outcomes (1 – 100)	76.40 (16.15)	73.43 (16.15)	75.17 (16.21)
Value of outcomes (1 – 100)	76.61 (16.44)	74.52 (16.92)	75.75 (16.61)
Temporal proximity of outcomes (1 – 7)	3.11 (1.46)	3.41 (1.09)	3.24 (1.31)

Note. PLR = Physical Literacy in Residence, TSES = Teacher Self-Efficacy Scale.

Table 8

Effect of School Group and Physical Education Specialization on Self-Efficacy for Fostering Physical Literacy in Youth

Belief measure	B	S.E.B	β	S.E. β	R^2
Engagement efficacy (n = 186)					.122**
School group	.290	.261	.101	.090	
PE specialization	.320	.452	.089	.126	
SG x PES	.720	.579	.151	.120	
Instructional efficacy (n = 185)					.125**
School group	.288	.200	.102	.070	
PE specialization	.665**	.199	.188***	.053	
SG x PES	-.012	.435	-.003	.093	
Classroom management efficacy (n = 186)					.086*
School group	-.034	.212	-.013	.079	
PE specialization	.089	.266	.026	.079	
SG x PES	.447	.448	.100	.100	
Modified TSES (n = 185)					.121**
School group	.166	.206	.065	.081	
PE specialization	.360	.256	.113	.081	
SG x PES	.363	.439	.086	.103	

Note. *$p < .05$; **$p < .01$, ***$p < .001$; PE = Physical Education, SG = School Group, PES = Physical Education Specialization, TSES = Teacher Self-Efficacy Scale. Geographic location and gender were included in the models as covariates.

Table 9

Effect of School Group and Physical Education Specialization on Expected Outcomes for Fostering Physical Literacy in Youth

Belief measure	B	S.E.B	β	S.E. β	R^2
Likelihood of outcomes (n = 157)					.033
School group	1.69	4.00	.051	.121	
PE specialization	1.30	3.69	.025	.091	
SG x PES	7.47	3.70	.136	.124	
Value of outcomes (n = 152)					.014
School group	1.71	4.09	.051	.121	
PE specialization	1.26	4.12	.030	.098	
SG x PES	3.92	6.88	.071	.125	
Temporal proximity of outcomes (n = 121)					.066
School group	-.217	.362	-.082	.137	
PE specialization	.043	.440	.013	.134	
SG x PES	-.848	.595	-.200	.143	

Note. $*p < .05$; $**p < .01$, *** $p < .001$; PE = Physical Education, SG = School Group, PES = Physical Education Specialization, TSES = Teacher Self-Efficacy Scale. Geographic location and gender were included in the models as covariates.

Table 10

R-Squared Matrix of Belief Scales for Fostering Physical Literacy

Belief measure	Likelihood of outcomes	Value of outcomes	Temporal proximity of outcomes
Student engagement self-efficacy	.165***	.166**	.036
Instructional strategies self-efficacy	.140*	.142*	.081
Classroom management efficacy	.137*	.121*	.049
Modified TSES	.178***	.172**	.069

Note. *$p < .05$; **$p < .01$, *** $p < .001$. Full model of outcomes regressed onto total self-efficacy: $R^2 = .206$, $p = .005$; TSES = Teacher Self-Efficacy Scale.

Table 11

Multiple Regressions Examining Teaching Experience and Teacher's Beliefs for Fostering Physical Literacy

Belief measure	B	S.E.B	β	S.E. β	R^2
Engagement efficacy (n = 186)	-.059	.200	-.019	.064	.058
Instructional efficacy (n = 185)	-.141	.169	-.046	.056	.086**
Classroom management efficacy (n = 186)	.061	.195	.021	.066	.073*
Modified TSES (n = 186)	-.051	.172	-.019	.062	.082**
Likelihood of outcomes (n = 157)	-2.93	2.83	-.083	.080	.010
Value of outcomes (n = 152)	-2.42	3.24	-.067	.089	.005
Temporal proximity of outcomes (n = 121)	.59*	.252	.197*	.083	.052

Note. *$p < .05$; **$p < .01$; TSES = Teacher Self-Efficacy Scale. Geographic location and gender were included in the models as covariates.

Appendix B: Information Letter and Implied Consent Form

Physical Literacy in Residence Evaluation

Information Letter & Implied Consent

What are we doing?

Ever Active Schools is currently implementing the Physical Literacy in Residence project which uses school-wide professional development, additional school resources and support, community partnership development, and teacher mentorship to enhance the school's ability to foster physical literacy opportunities for students. We are surveying teachers about their knowledge and beliefs about physical literacy in schools involved, and not involved, with the project. The data from the survey will be used as a part of a study being done by researchers at the University of Alberta.

Why are we doing the survey and research study?

The purpose of the survey is to assess teachers' knowledge and beliefs about physical literacy. This research study will be one of the first to collect information about physical literacy. We want to see how effective the Physical Literacy in Residence program was to develop better opportunities for teacher mentorship and ultimately improve children's chances for increased physical activity and healthy lifestyle choices.

When and where will we be doing this?

You will be contacted twice via email over a period of several months in between surveys. The surveys can be done online at your own convenience.

What are we asking you to do?

We are asking you to complete the survey that has been sent to you online by Ever Active Schools.

How will we protect your privacy?

All information provided by you will remain confidential. At no time will your identify be revealed to parties outside of the research team. The surveys will be anonymized and any identifying information will be kept confidential by the University of Alberta researchers. Any identifying information will not be released to anyone but the researchers. The data will be kept for five years and only used for the research purposes.

The survey will be done using SurveyMonkey Inc. software. Please note that information collected will be transmitted to and stored on servers outside of the University, Alberta and Canada and the University cannot guarantee protection against disclosures as a consequence of foreign laws. If you desire you may find more information about the policies of SurveyMonkey Inc. at https://www.surveymonkey.com/mp/policy/privacy-policy/.

If the data is used for other studies, approval will be obtained through a research ethics board. You can choose to withdraw yourself and your information from the study up to two weeks after you have completed the online survey. If you decide to do so, your information and survey will be erased.

There is no pressure for you to take the survey. If you'd like, you can skip questions that you do not want to answer. If you choose not to participate in the study and you are involved with the Physical Literacy in Residence project, your school's support from Ever Active Schools will not be impacted. If you are not in the Physical Literacy in Residence project, your school's chances to be involved in the program in the future will not be affected. However, we do hope that you participate.

If you have questions:

- You can contact the principal investigator Dr. John Spence at jc.spence@ualberta.ca, (780) 492-1379, or the research coordinator Brendan Wohlers at bwohlers@ualberta, (780) 492-3252.
- The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Thank you for taking the time to review this information,

Sincerely,

Principal Investigator	*Co-Investigator*	*Research Coordinator*
Dr. John Spence Ph.D. *Vice Dean and Professor* *Faculty of Physical Education and Recreation,* *University of Alberta* *Office: 780-492-1379* *jc.spence@ualberta.ca*	*Dr. Nicholas Holt Ph.D.* *Professor and Associate Dean of Research* *Faculty of Physical Education and Recreation,* *University of Alberta* *Office: 780-492-7386* *nick.holt@ualberta.ca*	*Brendan Wohlers B.Ed, B. Kin* *Graduate Student* *Faculty of Physical Education and Recreation,* *University of Alberta* *Office: 780-492-3252* *bwohlers@ualberta.ca*

Consent Statement

I read the above information letter and understand what is being asked. I recognize that I have had the opportunity to ask questions about the research. I understand that I may withdraw my consent at any time and for any reason.

If I have additional questions, I have been told whom to contact. I agree to participate in the online physical literacy research project hosted by the University of Alberta. By participating in the survey, I give informed consent for my answers to be used for research purposes by the University of Alberta.

Appendix C: Survey

Physical Literacy in Residence Survey

Thank you for completing this survey as part of the Physical Literacy initiative happening at your school or as a comparison school receiving this survey. The survey is intended to be completed by all teaching staff. A version of this survey is being received by over 100 Albertan schools.

Your answers will be anonymized and de-identified and will be aggregated to assess the impact the initiative has had in your local school community. All information will remain confidential.

Please take the next 15 minutes to complete the survey.

Thank you!

General Information

Please choose the gender that you most identify with.

- ◯ Female
- ◯ Male
- ◯ Not listed
- ◯ Prefer not to say

What is the name of your school?

_____

What does the term "physical literacy" mean to you?

_____

	Very Little						Very much
Please rate your comfort and confidence in teaching physical education:	◯	◯	◯	◯	◯	◯	◯
Please rate your comfort and confidence in fostering physical literacy in your students:	◯	◯	◯	◯	◯	◯	◯

Have you participated in learning opportunities related to physical activity, physical literacy, and/or physical and health education in the last year?

- ◯ Yes
- ◯ No

How many years of teaching experience do you have?

- ◯ 0-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 15-20 years
- ◯ 20+ years

Have you been educated as a physical education specialist?

- ◯ Yes
- ◯ No

School Environment

To what extent do each of the following statements apply to your school?

	Unsure	Not at all	Slightly	Moderately	Sometimes	Most of the time	Always
The physical environments of the school assists students in developing the skills they need to lead an active lifestyle through their involvement in physical activity.	○	○	○	○	○	○	○
The social environments of the school assists students in developing the skills they need to lead an active lifestyle through their involvement in physical activity.	○	○	○	○	○	○	○
School staff set a tone that supports involvement in physical activity.	○	○	○	○	○	○	○
Students' participation and/or accomplishment in physical activity are recognized and celebrated.	○	○	○	○	○	○	○
Students have the opportunity to develop leadership skills related to physical activity.	○	○	○	○	○	○	○
Our school's policies and/or practices contribute to physical activity opportunities for students.	○	○	○	○	○	○	○
Physical activities are embedded in the daily life/culture of the school (e.g. school assemblies, fund-raising, staff meetings).	○	○	○	○	○	○	○
Sport and other physical activities offered are designed to be inclusive of all students.	○	○	○	○	○	○	○
Students have access to a variety of facilities to engage in physical activity (e.g. gymnasiums, multipurpose rooms, outdoor paved areas, playing fields).	○	○	○	○	○	○	○

Students have access to a variety of equipment to engage in physical activity (eg. playground equipment, balls, skipping ropes).	○	○	○	○	○	○	○

Physical Literacy Resources

Which physical literacy resources are you familiar with?

	Don't know it	Aware of it	Have used it	Use it often
Canadian Consensus Statement on Physical Literacy	○	○	○	○
Sport for Life - PLAY tools (PLAYbasic, PLAYcoach, PLAYfun, PLAYself, PLAYparent)	○	○	○	○
Canadian Assessment of Physical Literacy (CAPL)	○	○	○	○
Physical and Health Education Canada - Passport for Life	○	○	○	○
Active for Life - Lesson Plan Builder	○	○	○	○
Manitoba in Motion - Recess Toolkit	○	○	○	○
Ever Active Schools - Recipe Card Lesson Plans	○	○	○	○
HIGH Five Certification	○	○	○	○
Be Fit for Life - Move and Play Cards	○	○	○	○

Physical Literacy Teaching Strategies & Practices

Physical literacy has been defined by Canadian groups as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life".

When lesson planning I intentionally include elements of physical literacy to support:

	Unsure	Not usually	Sometimes	Often	Usually	Always
Knowledge and Understanding	○	○	○	○	○	○
Physical Competence	○	○	○	○	○	○
Motivation	○	○	○	○	○	○
Confidence	○	○	○	○	○	○
Desire to value and engage in physical activities for life	○	○	○	○	○	○

Networks of Support

Please indicate your level of interaction with the following organizations:

	Don't know of them	Know of them	Interact with them sometimes	Interact with them often
Local PLAY groups	○	○	○	○
Ever Active Schools	○	○	○	○
Be Fit for Life Centre	○	○	○	○
Physical & Health Education Canada	○	○	○	○
ParticipACTION	○	○	○	○
Active for Life	○	○	○	○
Sport for Life Society	○	○	○	○
Alberta Health Services	○	○	○	○
HIGH FIVE	○	○	○	○
Health & Physical Education Council (Alberta Teacher's Association)	○	○	○	○
Local Outdoor Centres	○	○	○	○
Local Recreation Centres	○	○	○	○
Local Sports Leagues	○	○	○	○

Please list any other partners that you connect with for support on physical activity, physical literacy, and/or health and physical education: _____

Teacher Beliefs

This questionnaire is designed to help us gain a better understanding of the things that create difficulties for teachers in their school activities.

Physical literacy has been defined by Canadian groups as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life".

Please indicate your opinion about each of the statements below.

	Unsure	Nothing		Very Little		Some Influence		Quite A Bit		A Great Deal
How much can you do to control disruptive behavior while teaching concepts related to physical literacy?	○	○	○	○	○	○	○	○	○	○
How much can you do to motivate students who show low interest in physical literacy concepts?	○	○	○	○	○	○	○	○	○	○
How much can you do to get students to believe they can do well in physical-literacy related activities?	○	○	○	○	○	○	○	○	○	○
How much can you do to help your students value physical literacy?	○	○	○	○	○	○	○	○	○	○
To what extent can you craft good physical literacy learning activities for your students?	○	○	○	○	○	○	○	○	○	○
How much can you do to get students to follow class rules while engaging in physical activities?	○	○	○	○	○	○	○	○	○	○
How much can you do to calm a student who is disruptive or noisy while engaging in physical literacy activities?	○	○	○	○	○	○	○	○	○	○
How well can you establish a classroom management system with each group of students?	○	○	○	○	○	○	○	○	○	○
How much can you use a variety of assessment strategies for physical literacy?	○	○	○	○	○	○	○	○	○	○

To what extent can you provide an alternative explanation or example when students are confused?	○	○	○	○	○	○	○	○	○	○
How much can you assist families in helping their children do well in physical literacy-related activities?	○	○	○	○	○	○	○	○	○	○
How well can you implement alternative strategies in your class when teaching physical literacy activities?	○	○	○	○	○	○	○	○	○	○

Teacher Beliefs Continued - Last Page

Physical literacy has been defined by Canadian groups as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life".

Please indicate your opinion for outcomes about teaching physical literacy for likelihood, desirability, and time.

1a. Intentionally adding physical literacy concepts to my lessons will increase their quality.

Unlikely — Likely

(Place a mark on the scale above)

1b Intentionally adding physical literacy concepts to my lessons will increase their quality.

Undesirable — Desirable

(Place a mark on the scale above)

1c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

2a. Purposely including physical literacy concepts in my lessons will make me feel better about my teaching.

Unlikely — Likely

(Place a mark on the scale above)

2b. Purposely including physical literacy concepts in my lessons will make me feel better about my teaching.

Undesirable — Desirable

(Place a mark on the scale above)

2c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

3a. Discussing physical literacy with my peers will make me appear that I am informed about current educational trends.

Unlikely — Likely

(Place a mark on the scale above)

3b. Discussing physical literacy with my peers will make me appear that I am informed about current educational trends.

Undesirable — Desirable

(Place a mark on the scale above)

3c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

4a. By intentionally using physical literacy concepts it will be easier to meet curricular requirements.

Unlikely — Likely

(Place a mark on the scale above)

4b. By intentionally using physical literacy concepts it will be easier to meet curricular requirements.

Undesirable — Desirable

(Place a mark on the scale above)

4c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

5a. Purposely including physical literacy concepts in my teaching will add to my daily workload.

Unlikely — Likely

(Place a mark on the scale above)

5b. Purposely including physical literacy concepts in my teaching will add to my daily workload.

Undesirable — Desirable

(Place a mark on the scale above)

5c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

6a Deliberately including physical literacy concepts in my lessons will make me feel like a capable teacher.

Unlikely — Likely

(Place a mark on the scale above)

6b. Deliberately including physical literacy in my lessons will make me feel like a capable teacher.

Undesirable — Desirable

(Place a mark on the scale above)

6c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

7a. Intentionally using physical literacy in my lessons will make my class content more relevant for my students.

Unlikely Likely

(Place a mark on the scale above)

7b. Intentionally using physical literacy in my lessons will make my class content more relevant for my students.

Undesirable Desirable

(Place a mark on the scale above)

7c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

8a. Deliberately teaching with physical literacy concepts in-mind will make my day less stressful.

Unlikely Likely

(Place a mark on the scale above)

8b. Deliberately teaching with physical literacy concepts in-mind will make my day less stressful.

Undesirable Desirable

(Place a mark on the scale above)

8c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

9a. By intentionally including physical literacy concepts in my class content I will feel more satisfied with my teaching.

Unlikely Likely

(Place a mark on the scale above)

9b. By intentionally including physical literacy concepts in my class content I will feel more satisfied with my teaching.

Undesirable Desirable

(Place a mark on the scale above)

9c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

10a. Teaching with physical literacy in mind will diminish the quality of my class' overall environment.

Unlikely Likely

(Place a mark on the scale above)

10b. Teaching with physical literacy in mind will diminish the quality of my class' overall environment.

Undesirable Desirable

(Place a mark on the scale above)

10c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

11a. Sharing the idea of physical literacy with my colleagues will make me look competent.

Unlikely Likely

(Place a mark on the scale above)

11b. Sharing the idea of physical literacy with my colleagues will make me look competent.

Undesirable Desirable

(Place a mark on the scale above)

11c. How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure

12a Intentionally incorporating physical literacy into my classes will earn the support of my school administration.

Unlikely Likely

(Place a mark on the scale above)

12b Intentionally incorporating physical literacy into my classes will earn the support of my school administration.

Undesirable Desirable

(Place a mark on the scale above)

12c How long will the above take to come into effect?

◯ Less than a week ◯ 1-4 weeks
◯ 1-2 months ◯ 2-5 months
◯ Half a year to a full school year
◯ 1-2 school years ◯ Never
◯ Unsure