

Vol 11 no 1



Revue phénEPS / PHEnex Journal

**Understanding the Physical Literacy Journey: A Qualitative Bioecological Investigation of Three Physically Active Boys' Perceptions and Experiences**

**Simon Schaerz**

University of Lethbridge  
Lethbridge, AB  
CANADA

**Dr. Daniel W. Balderson**

University of Lethbridge  
Lethbridge, AB  
CANADA

**Author Biographies**

**Simon Schaerz** is a doctoral candidate in the Faculty of Education at the University of Lethbridge. Simon researches the bioecological aspects of childhood physical activity engagement. Simon also instructs in the Exercise Science program at Lethbridge College.

**Dr. Daniel W. Balderson** is an Associate Professor and Assistant Dean of Student Program Services in the Faculty of Education at the University of Lethbridge. His areas of research are in physical education teacher education and wellness promotion.

## **Abstract**

Physical literacy is at the center of current childhood physical activity discourse, but many questions remain unanswered. The aim of our investigation was to learn about the physical literacy journey of children from a bioecological perspective. Three physically active boys, aged 10 and 11 participated in individual semi-structured interviews. The goal of the interviews was to learn about the physical literacy journey from the perspective of children. Our analysis revealed that frequent, long-lasting, and varied physical activity was the cornerstone of the participants' physical literacy journey. The participants' motivation, confidence, and physical competence and the ongoing reciprocal interactions with their peers and family members at home, in school, and in organized sport settings promoted frequent, long-lasting, and varied physical activity. In the future, childhood physical activity researchers might wish to incorporate bioecological perspectives on human development to further study the variables that shape children's physical literacy journey.

**Keywords:** bioecological model; childhood physical activity; physical literacy journey

## **Résumé**

La littératie physique est au cœur du discours actuel sur l'activité physique des enfants, mais plusieurs questions dans ce domaine demeurent sans réponses. Le but de notre recherche était de développer des connaissances sur le parcours d'enfants dans le développement de leur littératie physique dans une perspective bioécologique. Trois garçons physiquement actifs, âgés de 10 et 11 ans ont réalisé une entrevue semi structurée qui avait pour but de les amener à parler de leur parcours dans ce domaine de la littératie physique. Notre analyse a révélé que leur parcours était ancré dans une pratique d'activité physique, fréquente, à long terme et variée. La motivation des participants, leur confiance, leurs habiletés physiques, les interactions continues avec leurs pairs, les membres de la famille, l'école et les milieux de sport organisé ont contribué à ce type de pratique d'activité physique. Les chercheurs dans le domaine de l'activité physique chez les enfants pourraient incorporer cette perspective bioécologique sur le développement humain pour approfondir leur étude de variables qui influencent ce parcours d'enfants en littératie physique.

**Mots-clés :** modèle bioécologique; littératie physique; parcours

## Introduction

Physical literacy encompasses the characteristics that lead children to value and take responsibility for lifelong physical activity engagement (International Physical Literacy Association, 2017; Whitehead, 2010a). Childhood physical activity researchers point out that motivation, confidence, physical competence, knowledge and understanding are the most influential characteristics related to children's physical activity (Chen, Liu, & Schaben, 2017; Dishman, McIver, Dowda, Saunders, & Pate, 2015; Timo, Sami, Anthony, & Jarmo, 2016). A physically literate child therefore demonstrates movement proficiency and fitness, a willingness and eagerness to participate in physical activity, a belief in his or her abilities, and the capacity to read the environment and initiate appropriate and intelligent responses (Whitehead, 2010b). Fewer than 10 percent of Canadian children accumulate enough physical activity to meet the 60-minute per day recommendation (Canadian Society for Exercise Physiology, 2018; Colley et al., 2017). Low levels of physical activity appear to be underpinned by low levels of physical literacy, as only 36% of Children in Canada meet the minimum physical literacy recommendations (ParticipACTION, 2018).

Physical literacy evolves as children grow and develop. Stakeholders, such as educators, parents, and coaches should view physical literacy as a journey that varies by culture, environment, and the physical endowment of children (Whitehead, 2010b). Educators, parents, and coaches are in an advantaged position to promote supportive and counteract disruptive influencers of children's development (Bronfenbrenner & Morris, 2006), including the development of physical literacy. To nurture physical literacy, a holistic understanding of the physical literacy journey is key.

At the turn of the millennium, physical literacy researchers were primarily focused on establishing consensus on a unified definition for physical literacy (e.g., Whitehead, 2001, 2007). The International Physical Literacy Association (2017) offers the most up-to-date definition for physical literacy as "...the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life" (para. 1). In the last decade, researchers shifted their attention towards creating assessment tools. The Canadian Assessment for Physical Literacy is one example of a valid and reliable tool for measuring physical literacy (Longmuir et al., 2015). In the last three years, researchers have started to push the discourse towards an understanding of the physical literacy journey (e.g., Bryant, 2017; Green, Roberts, Sheehan, & Keegan, 2018). However, we presently know very little about the physical literacy journey. Hence, the purpose of this investigation was to interview children and document the experiences and perceptions unique to their physical literacy journey. More precisely, our objective was to learn what developmental processes lie at the centre of a child's physical literacy journey and how various bioecological factors influence these developmental processes. Moreover, we wanted to identify potential strategies that help stakeholder support children's physical literacy journey.

## Theoretical Framework

The bioecological model provides a comprehensive framework for understanding how child-level, context-level, and time-level factors influence human development

## Bioecological model - childhood physical activity - physical literacy journey

(Bronfenbrenner & Morris, 2006). In this model, human development is the outcome of developmental processes, characterized as interactions between a developing child and the individuals, objects, and symbols in the immediate environment (Bronfenbrenner & Morris, 2006). For developmental processes to be effective, the interactions must be reciprocated; they must be frequent and long lasting; and, they must become progressively more complex over time.

The characteristics of the developing child promote and deter development. Bronfenbrenner and Morris (2006) proposed three influential child-level characteristics: dispositions, resources, and demands. Dispositions are the inherent qualities of the developing child's mind and character. Dispositions include motivation, confidence, persistence, and temperament. Resource characteristics are the physical and cognitive characteristics that promote and deter development. Examples include ability, knowledge, and fitness. Resource characteristics also include the experiences of the developing person, such as exposure to certain sports. Demand characteristics refer to physical traits, such as sex, age, and height. The effects of these characteristics are mostly indirect, mediated by how they promote or deter developmental processes (Bronfenbrenner & Morris, 2006; Farrant & Zubrick, 2012).

Much like the characteristics of the child, the immediate and distant physical, social, economic, and political environments (i.e., context) also promote and deter the developmental processes that lead to human development (Bronfenbrenner & Morris, 2006). The context envelops several nested systems. The microsystem is the innermost system and encompasses interpersonal relationships that occur with individuals in immediate surroundings. For instance, learning to ride a bicycle from a parent or playing with a sibling. The mesosystem is the relative harmony or disharmony between various aspects of the microsystem, such as the relationship between a child's parents and his or her coach. The exosystem is best characterized as peripheral elements that indirectly affect elements within the child's microsystem. For example, a parent's own experiences with physical activity. The macrosystem is the outermost layer of the developing child's context (Bronfenbrenner, 1979). This system includes the religious, political, cultural, and social characteristics that affect the developing child.

Human development is further influenced by the frequency and duration of developmental processes in what Bronfenbrenner and Morris (2006) referred to as micro and mesotime. Examples of micro and mesotime might include the length of a particular sport practice, how often the practice occurs over the course of a week or month, and how long a child participates in the sport over the span of a decade or more. The third temporal level is macrotime. Macrotime focuses on the changes to elements of the bioecological model over time and the historical periods in which they occur. In reference to Elder's (1974) work, Bronfenbrenner (1979) wrote about the influence of the great depression on the development of children. He summarized that the effects of the great depression were different, depending on whether crucial periods of children's development aligned with the beginning, middle, or the end of the depression.

Researchers have applied the bioecological model to various fields, such as psychology, sociology, and education (Tudge et al., 2016). However, only Nobre and colleagues (2014) comprehensively applied the bioecological model to study childhood physical activity. To date, there are no published studies that have attempted to situate physical literacy within a bioecologically oriented developmental framework.

## Methods

To study children's perceptions and experiences related to their physical literacy journey, we chose a constructivist informed qualitative approach. Constructivists postulate that individuals construct themselves through interactions with immediate and more distant physical and social environments (Gall, Gall, & Borg, 2007). Within this epistemological and ontological frame, a child's physical literacy journey is largely shaped by the interactions between the child and their peers, parents, educators, coaches, and others. We collected qualitative interview data that focused on thick description of perceptions and experiences.

### Participants

We invited three prepubescent boys from a physical activity-based summer camp to participate in our interviews. Due to the low enrollment of girls in the camp (12 boys and 1 girl), our sample for this study was limited to boys. We focused on this age group because the prepubescent years represent an important window in the development of positive physical activity habits (Whitehead, 2010b). Childhood physical activity researchers have shown that in Canada, there is a significant reduction in physical activity as children enter adolescence (e.g., Cameron, Craig, Bauman, & Tudor-Locke, 2016; Colley et al., 2017). Prepubescent children possess the intellectual and emotional characteristics we felt were important to provide detailed and coherent responses to the interview questions.

The investigation's interviewer participated in the planning of the physical activity-based summer camp and interacted with the participants during several of the camp's activities. However, two paid camp instructors facilitated the camp's daily activities. We hired camp instructors to avoid creating a power imbalance between the participants and the interviewer.

### Data Collection Procedures

Before we scheduled the individual interviews, the parents provided written consent for their child's participation. The children also verbally assented to their participation. All of the participants completed the Canadian Assessment for Physical Literacy 2.0 (Healthy Active Living and Obesity Research Group, 2017) at the outset of the investigation and we shared the result with them prior to the interview. The interviewer then conducted each of the three individual interviews. The interviewer used an open-ended format, using a semi-structured interview schedule. The schedule included preconfigured, bioecologically framed questions and flexible follow-up questions. Prior to commencing, the interviewer asked each of the children if they had any questions or concerns about the consent process or any other part of the research. The interviewer also informed the children that there were no right or wrong answers to the questions and that the interviewer was only interested in learning about their experiences and perceptions. The interviewer recorded the interviews using the iOS VoiceNotes application. In order to receive quality responses from participants, Krueger and Casey (2015) recommended that investigators first establish trust and rapport. To that end, the interviewer interacted with the participants on several occasions during the camp. The three individual interviews each lasted approximately 45 minutes.

## Bioecological model - childhood physical activity - physical literacy journey

### **Trustworthiness**

The interviewer interacted with the participants during the summer camp on several days prior to the individual interviews. The interactions gave the interviewer the opportunity to establish trust and rapport so that the participants would feel comfortable during the interviews. We should point out that the pre-existing relationship between participants and primary investigator may also have had negative consequences. For instance, the participants may have overstated or embellished certain aspects of the physical literacy journey because they felt they needed to provide the interviewer with rich responses.

The interviewer also took detailed notes during each of the individual interviews. Upon completion, the interviewer member checked the interview responses by reading the notes back to the participants and asking them to correct any misheard, misrepresented, and/or omitted responses. The participants did not make any additions or corrections. After compiling the results of the investigation, the interviewer met a colleague to discuss the results. The colleague holds a doctoral degree in education and has experience with qualitative research. The intent of the peer-debrief was to establish trustworthiness by having a third party critically review whether the results were grounded in the children's statements (Marshall & Rossman, 2014). The peer-debrief did not yield significant disagreement.

### **Ethics**

Prior to commencing this investigation, we gained ethical approval from two local institutional research ethics boards. The research ethics boards deemed the investigation appropriate, safe, and consistent with the most current version of the Tri-Council Policy for the Ethical Conduct of Research Involving Humans.

### **Data Analysis**

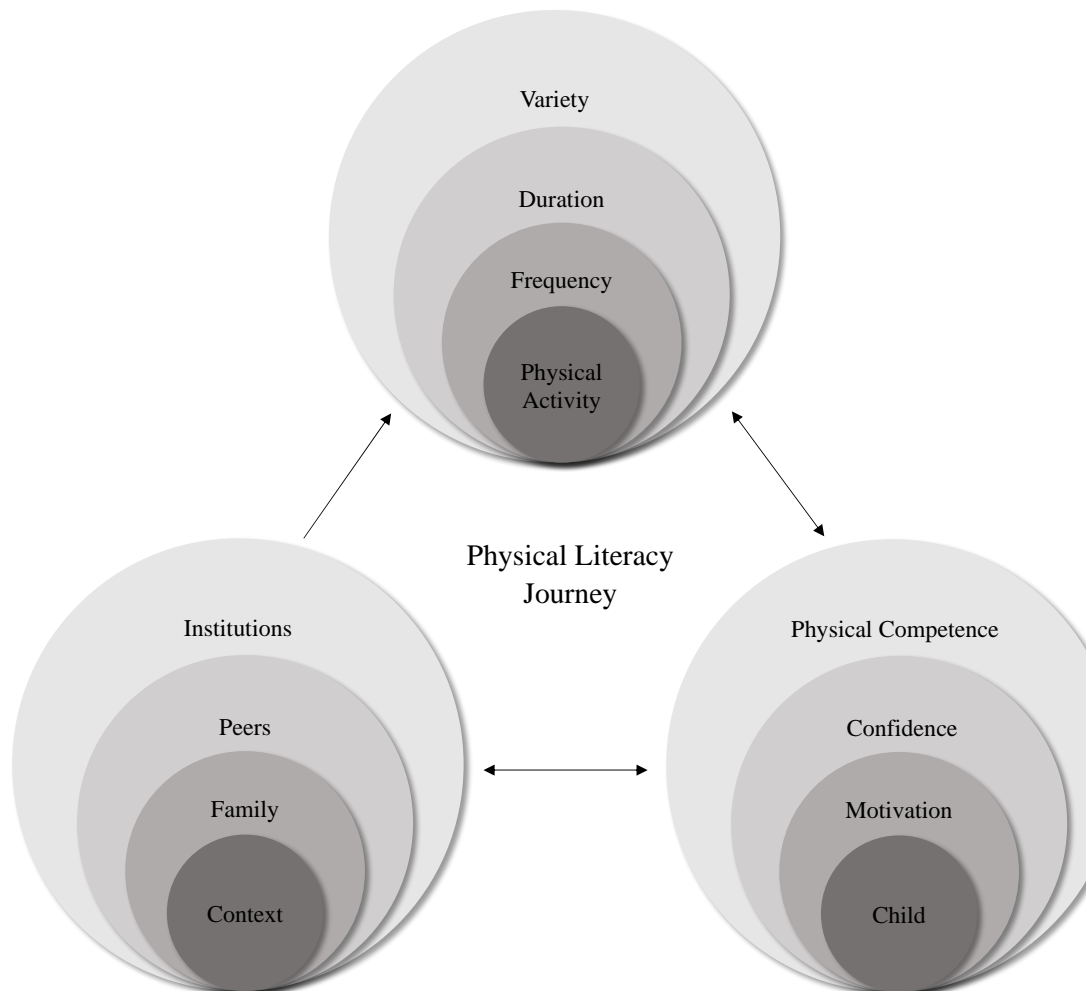
The interviewer used NVivo qualitative data analysis software; QSR International Pty Ltd. Version 12, 2017 to analyze the individual interview data. The interviewer transcribed the three audio files word-for-word, not including pauses, and fillers (e.g., um, ah, like) using the NVivo embedded word processor. Braun and Clarke's (2006) thematic analysis protocol served as a framework for coding comments from the transcripts. The purpose of the coding was to identify commonalities running through the three transcripts. The interviewer deductively grouped the codes and corresponding comment extracts into categories and themes that were consistent with Urie Bronfenbrenner's bioecological model (Bronfenbrenner & Morris, 2006).

## **Results and Discussion**

In line with the bioecological model, we grouped the results by the perceptions and experiences related to the participants' physical literacy journey. As outlined in Figure 1, our analysis revealed three broad themes (i.e., physical activity, context, child), each containing three unique categories (e.g., duration, peers, motivation). We situated the participants' perceptions and experiences within recent academic publications pertaining to childhood physical activity and physical literacy. All three participants completed the Canadian Assessment of Physical Literacy 2.0 (Healthy Active Living and Obesity

Bioecological model - childhood physical activity - physical literacy journey

Research Group, 2017) as part of the physical activity-based summer camps. Table 1 outlines their domain and overall percentage scores.



**Figure 1.** Thematic map indicating three themes (i.e., child, physical activity, context) and corresponding categories related to the physical literacy journey of three physically active prepubescent boys.

## Bioecological model - childhood physical activity - physical literacy journey

Table 1  
*Canadian Assessment for Physical Literacy 2.0 Results for Individual Interview Participants*

Pseudonym	Age	Sex	Physical Competence	Daily Physical Activity Behavior	Motivation and Confidence	Knowledge and Understanding	Overall Physical Literacy
Danny	11	Male	73.3	96.7	95.0	90.0	88.5
George	11	Male	73.3	100.0	91.7	90.0	88.5
Nolan	10	Male	76.7	96.7	100.0	80.0	90.0

*Note.* Age (years), sex, and Canadian Assessment for Physical Literacy 2.0 domain and overall physical literacy percentage scores for each of the three participants. We assigned percentage scores to each of the four domains. Beginning = <17th percentile; Progressing = 17th to 65th percentiles; Achieving = >65th to 85th percentiles; Excelling = >85th percentile (Healthy Active Living and Obesity Research Group, 2017)



### Physical Activity

When we asked the children about their physical literacy journey, their experiences and perceptions were mostly centered on physical activity. Prior to the interviews, we shared the Canadian Assessment for Physical Literacy 2.0 percentage scores (Table 1) with the participants. They attributed their high scores to varied, frequent, and long-lasting physical activity engagement. If physical literacy is a journey, then physical activity is the vehicle for undertaking that journey. Physical activity, the participants commented, allows them to hone the skills needed to embark on the journey. The participants demonstrated a very good understanding of physical activity. They articulated it as including not just planned exercise and structured sport, but also unplanned and unstructured activities, such as playing and carrying out chores. We made the point of asking this question as children sometimes associate physical activity solely with sport or exercise.

The link between regular physical activity engagement and physical literacy remains largely theoretical, as childhood physical activity researchers have yet to publish longitudinal evidence (Edwards, Bryant, Keegan, Morgan, & Jones, 2017; Longmuir & Tremblay, 2016). Our findings do not offer quantitative support for this link; however, they do highlight that children perceive physical activity engagement to be a crucial element in their physical literacy journey. In relation to physical activity, we identified three subthemes: variety, frequency, and duration.

**Variety.** Our analysis of the participants' perceptions and experiences revealed that although the participants have favorite activities, none of them have limited themselves to just one form of physical activity. The participants balance planned and organized forms of physical activity—including soccer and baseball—with unplanned and unstructured activities—including hiking and bicycling. George's comment exemplifies the varied physical activity engagement that was evident in all the participants:

...sometimes I just go for a run just for fun. Sometimes I go hunting in coulees with a bow. So I just, you just kind of walk around, sort of practice being slow and sneaking up on gophers and stuff...

Of further significance is that the participants demonstrated their awareness of the benefits of varied physical activity. They understand that varied physical activity engagement allows them to hone a multitude of transferable skills. In turn, the honed skills allow them to partake in more complex forms of physical activity.

The participants' varied physical activity participation encourages long-term physical activity engagement (Coté, Horton, MacDonald, & Wilkes, 2009). Recent research cautions children against overemphasizing one type of physical activity at the expense of others (Jayanthi, LaBella, Fischer, Pasulka, & Dugas, 2015; Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013). This approach, known as early sport specialization, can negatively impact movement skill proficiency, fitness, and long term physical activity participation, and it raises the likelihood of burnout and injury (DiFiori et al., 2014; DiStefano et al., 2018; Jayanthi et al., 2015). In contrast, children who sample many different physical activities tend to stay physically active longer and develop more versatile movement skills (Coté et al., 2009; DiStefano et al., 2018; Fransen et al., 2012).

**Frequency and Duration.** When asked how frequently and how long the participants engage in physical activity, they answered that physical activity consumes a significant part of their day. All the participants are physically active several times per day and on most days of the week. For example, playing soccer and other games during school breaks, followed by organized soccer in the evening. The participants spend most of their daily free time engaging in some form of physical activity. With respect to duration, the participants indicated that most of their physical

## Bioecological model - childhood physical activity - physical literacy journey

activities last a minimum of one hour. The participants are poised to let activities run their course, rather than ending the activity based on specific timeframes. The only exception to that were physical activities that had externally imposed, predetermined timeframes, such as those occurring during school breaks or organized sport activities.

The pedometer data that we collected as part of the Canadian Assessment for Physical Literacy 2.0 supports the high frequency and duration of the participants' physical activity. All the participants regularly accumulated more than 15,000 daily steps. For reference, 13,000 daily steps represents the threshold associated with meeting the Canadian recommendations for physical activity (Canadian Society for Exercise Physiology, 2018; Colley et al., 2017).

Children's physical literacy hinges on frequent and long-lasting physical activity participation (Whitehead, 2010a). According to the participants' comments and their Canadian Assessment for Physical Literacy 2.0 results, they regularly exceed the Canadian recommendations for physical activity (Canadian Society for Exercise Physiology, 2018). At present, fewer than 10 percent of children in Canada meet these recommendations (Colley et al., 2017).

In sum, the experiences and perceptions of the participants highlighted the importance of physical activity. Within a bioecological framework (Bronfenbrenner & Morris, 2006), varied, frequent and long-lasting physical activity constitutes the developmental process that underpins the physical literacy journey.

### Child

When we asked the participants about promotive elements to the physical literacy journey, many of their answers reflected their own disposition and resource characteristics. Notably, there appears to be a reciprocal relationship between these characteristics and physical activity. In other words, the participants feel that when they frequently engage in varied and long-lasting physical activity, they hone the many characteristics that make them more likely to stay physically active across the lifespan. Whitehead (2010a) wrote about physical literacy as the continued interdependence between physical activity engagement and the characteristics of the child. When we probed the participants on what they perceived to be the most influential characteristics related to their physical literacy journey, they commented on motivation, physical competence, and confidence.

**Motivation.** According to the participants' comments, motivation is the initiator to engagement in physical activity. In other words, a healthy level of motivation is prerequisite to frequent engagement in physical activity. Whether going out to be active in the rain, playing soccer with friends, or playing games with peers during recess, the participants insisted that their motivation to do so initiates the activities. To cite George, "...if you don't have motivation you don't really feel the point of doing anything..." The motivation to engage in physical activity is a fundamental aspect of physical literacy (Whitehead, 2010a). Motivation promotes physical activity engagement, which then enhances other characteristics, such as physical competence and confidence.

The participants linked motivation to competence; that is, the participants' proficiency or success in a given activity influences their motivation. Danny provided a rich example that outlined his motivation for practicing his soccer skills. The friendly competition he engages in with his peers supports his skill-development, which provides him with a feeling of competence. In turn, he continues to practice to further hone his skills. The motivation to engage in a particular activity hinges, among other things, on the perceived competence for that task (Deci & Ryan, 1985). Self-determination theory postulates that the need to feel competent forms the basis for motivation. The

## Bioecological model - childhood physical activity - physical literacy journey

link between motivation and physical activity sits against the backdrop of extensive research (Chen, 2013). Motivation positively influences moderate to vigorous physical activity and negatively influences sedentary time in children (Dishman et al., 2015; Fenton, Duda, Quested, & Barrett, 2014)

**Physical Competence.** An additional category that emerged pertained to the participants' physical competence. The participants commented on ability and fitness as important promoters of the physical literacy journey. Physical competence appears to indirectly affect the participants' physical literacy journey by influencing the type of physical activity they engage in. Although the participants demonstrated varied physical activity engagement, their choices of activity reflect beliefs about their ability. For example, Danny and Nolan are drawn to soccer because of their proficiency in related skills, such as running and ball control. George is drawn to baseball because he believes that he was born with the skills that allow him to excel in that activity. In contrast, George feels that he does not have the inborn skills to excel activities such as swimming. George's perception reveals that perceived competence affects his physical activity engagement. His perception also highlights the belief that ability is largely innate. He believes that an individual's competence, and therefore the activities that they are best suited for, is primarily determined at birth.

The participants also commented on fitness related aspects of their physical literacy journey. The specific components of fitness that emerged were endurance and strength. These two characteristics, the participants commented, were not just important contributors to their physical activity engagement, but also their health. Fitness allows the participants to partake in their favorite activities and allows them to keep up with their peers. Danny's response illustrates a mechanistic view of fitness vis-à-vis his physical activity engagement:

Without endurance I might have a hard time running a [kids] marathon. Without leg muscles it might be a bit hard to play soccer and to run from end to end. And, without arm muscles it would be hard to run too because you lose out when you run when you move your triceps. When you run, and it kind of helps you run because it accelerates and because there is a bit of weight in your arm it helps you.

The participants view fitness as something that is much more amenable to practice than ability. Fitness, they insisted, is something they can and should strive towards. Doing so will not only impact their physical literacy journey but also their long-term health.

The extent and type of children's physical activity engagement largely depends on their physical competence (Whitehead, 2010b). A diverse number of studies have investigated whether physical competence translates to physical activity (e.g., Figueroa & An, 2017; Lloyd, Saunders, Bremer, & Tremblay, 2014). Timo et al. (2016) analyzed the link between physical activity engagement and child-perceived physical competence. They concluded that seventh graders who perceived themselves as being physically competent, were much more likely to be physically active in the twelfth grade. Whether perceived or objectively measured, research overwhelmingly supports the importance of physical competence for lifelong physical engagement.

**Confidence.** The confidence theme reflected the participants' perceptions and experiences that illustrated their belief in their ability. Our analysis showed that confidence and physical competence are inextricably linked. The participants feel confident in activities where they also perceive themselves as competent. For example, Nolan perceives himself as a competent soccer player and swimmer and therefore feels confident engaging in those activities. In contrast, George excels at baseball and therefore feels confident engaging in that activity. Confidence increases with task success, irrespective of the task itself. In particular, the participants commented about winning.

## Bioecological model - childhood physical activity - physical literacy journey

They feel that they receive a confidence boost every time they win a game or a race. As was the case with motivation and physical competence, confidence influences the physical literacy journey by exerting its influence on physical activity engagement. In the case of our participants, it influences the preferred type of physical activity (e.g., baseball versus swimming).

From a social cognitive perspective, self-efficacy is the main mechanism that influences a child's confidence (Bandura, 1997). Childhood physical activity researchers have studied the link between self-efficacy and physical activity (Sterdt, Liersch, & Walter, 2014). For instance, Sutton and colleagues (2013) measured the association between self-efficacy and physical activity engagement in 281 middle school children. Through questionnaires, the researchers measured how strongly children believed in their ability to complete physical tasks. They found that the children who they placed into the high self-efficacy group accumulated significantly more physical activity than the counterparts in the low self-efficacy group.

The participants' comments support the notion that child characteristics, such as confidence, motivation, and physical competence are not just products of a child's physical literacy journey but also determine its trajectory. According to the bioecological model, the effects of these characteristics on the physical literacy journey are likely indirect, mediated by how they promote or deter frequent, varied, and long-lasting engagement in physical activity (Bronfenbrenner & Morris, 2006; Farrant & Zubrick, 2012).

### Context

Context was the third theme that emerged from the participants' comments. Context refers to the interconnected social environments that incorporate the participants. In line with the participants' experiences and perceptions, contextual features envelop them and their physical activity engagement. In other words, their motivation, physical competence, and confidence, along with the variety, frequency, and duration of their physical activity engagement are modulated by their context. The participants find themselves within familial, peer, and institutional micro and mesosystems that value and nurture physical activity.

**Family.** The participants shared several experiences and perceptions that pointed to the family microsystem as a powerful promoter of the physical literacy journey. Coactivity between the participants and their parents and siblings is the main mechanism by which family promotes their physical literacy journey. Parents and siblings engage in regular physical activity with the participants; whether it is Danny and Nolan's daily bicycle rides with their parents during the summer months, or George playing catch with his mom or dad. Coactivity goes beyond simply ensuring that the participants engage in sufficient physical activity. Coactivity appears to also nurture the development of physical competence. Through frequent play, parents and siblings fulfill an important role in the participants' fundamental movement skill (e.g., catching, throwing) development. George's comment exemplifies this phenomenon:

When I'm [playing] baseball, my dad, my brother, and my mom pitch me the ball. When we catch pop flies my dad throws it up but I have to get under it and field it and he gives me pointers...

Our analysis of the participants' experiences and perceptions further revealed that parents are sources of extrinsic motivation. Through encouragement and positive attention, they incentivize the participants' physical activity engagement. This is especially true when the participants struggle to motivate themselves. As an example, Nolan said: "I think my parents really push me. They help me along. Sometimes I don't feel like playing soccer. They say, "Come on, [Nolan]. You've got this." So they help me a lot with that."

## Bioecological model - childhood physical activity - physical literacy journey

Parent income further affects the physical literacy journey of the participants. The effect of parent income is primarily on the variety of the participants' physical activity. In response to a question about the degree of choice with respect to the type of physical activity, Nolan commented: "We have enough money to do all that stuff, and so I can choose my sports." Moreover, Nolan cited money as the reason for being able to participate in more sports than his parents did when they were his age. George added to this by saying that without his parents, he would not be able to participate in sports at all.

The parents' past physical activity experiences also play a role in the participants' physical literacy journey. The participants' preferred activities mirror those of the parents. The parents prefer to engage in physical activities that they themselves enjoy or have experienced in the past. For Danny and Nolan that activity is soccer, whereas for George it is baseball.

Researchers have investigated the family microsystem and its link to childhood physical activity engagement (e.g., Pujadas-Botey, Bayrampour, Carson, Vinturache, & Tough, 2016; Rhodes & Lim, 2018). Previous intervention studies showed that coactivity reduced sedentary time and increased physical activity in children (e.g., O'Dwyer, Fairclough, Knowles, & Stratton, 2012). Research has also pointed out that parents' fitness and physical activity participation significantly influenced the physical activity participation of their children (e.g., Strutz, Browning, Smith, Lohse, & Cunningham-Sabo, 2018; Yoon, Lee, Ju, Nam, & Park, 2018). In other words, fit parents are more likely to be physically active with their children.

**Peers.** The microsystem that incorporates the participants and their peers influences the physical literacy journey in similar ways as the family microsystem—through meaningful and reciprocal interactions. These interactions primarily occur at school and in organized sport settings and often include elements of competition. All the participants are drawn to competition and enjoy the added challenge that it provides. Danny's comment exemplifies this point:

Yeah, [my friend] influence me too because my friend is really good at soccer, he plays [local soccer club]. Because of that, I try to compete with him, but not in [local soccer club]. At school, I try to be better than him and then he is still better than me, but I try and I try and I try. I might catch up.

Developmental processes must become more progressive over time in order to be effective (Bronfenbrenner & Morris, 2006). Activities that are static are more likely to lead to boredom and undermine continued engagement. In the case of the participants, friendly peer competition makes the activity more dynamic and may support long-term engagement.

Peers are more than just competitive elements in the participants' physical literacy journey—they create a sense of belonging. George enjoys the comradery that his peers offer when they are active during recess or playing baseball. Their shared experiences and common goals bring them closer together. Danny and Nolan referenced the same feelings of interconnectedness with their peers. This sense of belonging may support the participants' motivation. Self-determination theory postulates that intrinsic forms of motivation—the motivation that arises from the inherent enjoyment of the activity—requires a sense of belonging (Deci & Ryan, 1985). To be intrinsically motivated, individuals need to be able to relate not just to the activity but also to others who they share the experience with.

Peers play a significant role in children's physical activity (e.g., Garcia, Healy, & Rice, 2016; Sterdt et al., 2014). For instance, Pawlowski, Schipperijn, Tjørnhøj-Thomsen, and Troelsen (2018) learned that the most frequently cited reason for why children participate in physical activity was "just because my friends do" (p. 45) and "I like being together with my friends." (p. 45). Unfortunately, the same reason also compels some children to be inactive (i.e., play video

## Bioecological model - childhood physical activity - physical literacy journey

games) despite preferring physical activity.

**Institutions.** The mesosystem exerts its influence on the participants' physical literacy journey through two institutions: organized sport and school. These institutions primarily support the microsystems that encapsulate the participants and their peers. In other words, institutions create a space for meaningful and reciprocal peer-participant interactions. With respect to organized sport, Nolan and Danny participate in organized soccer while George plays organized baseball. They all cited relationships with peers as outcomes of their participation in sport. The participants also spoke about instruction as an important aspect of organized sport. The participants credited coach-participant interactions for their skill development. Nolan's comment highlights this:

I was on the Summer Games team, for the [Regional] Summer Games. I really enjoyed that because my coach was really helpful, and he told me what I was doing wrong and stuff and corrected it.

Seventy-seven percent of Canadian children participate in at least one organized sport over the course of the year (Canadian Fitness & Lifestyle Research Institute, 2018). Sport develops motor and psychosocial characteristics that are prerequisite to high performance and lifelong physical activity (Coté et al., 2009; Goodway & Robinson, 2015). Soccer and baseball encourage the development of a broad range of movement skills, including kicking, striking, catching, throwing, running, and agility (Balyi, Way, & Higgs, 2013).

Like organized sports, schools are also a medium for meaningful and reciprocal peer-participant interactions. Although the participants mentioned physical education and health classes, most of their comments related to non-curricular activities. Their comments revealed that non-curricular activities play a significant role in their physical literacy journey. At the centre of this non-curricular activity is recess-based physical activity. The participants commented that although school breaks are short, they make the most of this time by engaging in a myriad of child-organized activities. George's example comment provides some insight into the participants' recess-based physical activity:

At school we usually play tag games where, when they tag somebody they get more so that you have to try to get around them and we try to stay moving the whole recess and not just sit and do nothing. We usually find something to do unless we're tired from gym or something.

The importance of recess-based physical activity has garnered significant interest amongst researchers (e.g., Tercedor, Segura-Jiménez, Ávila García, & Huertas-Delgado, 2019). Recess is often children's favorite time of the day. The time away from structured classroom settings allows children to participate spontaneously in physical activity with their peers (Erwin et al., 2012). Behrens et al. (2019) found that when schools encouraged physical activity during recess, they were able to make a significant contribution to children's physical activity time.

The participants shared several contextual factors (i.e., family, peers, institutions) that they believe influence their physical literacy journey. According to the bioecological model, contextual factors exert their influence on the physical literacy journey by primarily affecting how children participate in physical activity (Bronfenbrenner & Morris, 2006). Meaningful and reciprocal interactions with peers and parents help to ensure that the participants frequently engage in varied, and long-lasting physical activity while simultaneously nurturing their motivation, confidence, and physical competence.

### **Conclusion, Practical Implications, and Limitations**

The participants' physical literacy journey are a product of frequent and long-lasting participation in various forms of physical activity. They regularly accumulate enough physical activity to double the Canadian physical activity recommendations. The participants highlighted that being coactive with peers and family has enhanced the quality of their physical activities, which they perceived as crucial elements to their physical literacy journey. Their experiences and perceptions also revealed that institutions, such as school and organized sport serve as important mediums for the physical literacy journey.

To summarize our findings within the bioecological model: physical activity engagement lies at the center of the physical literacy journey. The frequency, duration, and variety of the child's physical activity is interdependent with his or her motivation, physical competence, and confidence. The child's physical activity is situated within complex family and peer microsystems, which are further embedded in institutional mesosystems that include schools and organized sports. We offer the following bioecologically informed advice for promoting children's physical literacy journey:

- The process: Stakeholders' (e.g., educators, parents, coaches) should strive to encourage regular, long-lasting, and varied physical activity.
- The child: Stakeholders should promote physical activity that nurtures children's motivation, physical competence, and confidence.
- The context: Whenever possible, stakeholders should participate in physical activity alongside children or seek out opportunities for children to engage with others. Coactivity makes physical activity more meaningful and enhances the experience for children.

This investigation solely focused on the perceptions and experiences of three very physically active boys. Future investigations should amalgamate different data sources and include perceptions and experiences of both male and female children across many different physical activity engagement levels. Incorporating the perspectives of girls is especially important as physical inactivity amongst girls is significantly higher than in boys (Cameron et al., 2016; Colley et al., 2017). Physical literacy is a journey that varies systematically by the characteristics of the child and his or her immediate and more distant surroundings. To glean a complete understanding of the complexity of the physical literacy journey, researchers may wish to incorporate bioecological perspectives on human development.

## References

- Balyi, I., Way, R., & Higgs, C. (2013). *Long-term athlete development*. Windsor, ON: Human Kinetics.
- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York, NY: W.H. Freeman.
- Behrens, T. K., Holeva-Eklund, W. M., Luna, C., Carpenter, D., Tucker, E., Field, J., & Kelly, C. (2019). An evaluation of an unstructured and structured approach to increasing recess physical activity. *Journal of School Health, 89*(8), 636-642. doi:10.1111/josh.12787
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa
- Bronfenbrenner, U. (1979). *The ecology of human development, experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U., & Morris, P. (2006). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of child psychology* (Vol. 1, pp. 793-828). Hoboken, NJ: John Wiley & Sons.
- Bryant, C. X. (2017). Physical literacy is a journey, not a destination. *IDEA Fitness Journal, 14*(6), 76-77.
- Cameron, C., Craig, C. L., Bauman, A., & Tudor-Locke, C. (2016). CANPLAY study: Secular trends in steps/day amongst 5–19 year-old Canadians between 2005 and 2014. *Preventive Medicine, 86*, 28-33. doi:10.1016/j.ypmed.2015.12.020
- Canadian Fitness & Lifestyle Research Institute. (2018). Bulletin 2: Participation in organized physical activity and sport. Retrieved from <http://www.cflri.ca/document/bulletin-2-participation-organized-physical-activity-and-sport-0>
- Canadian Society for Exercise Physiology. (2018). Canadian 24-hour movement guidelines: An integration of physical activity, sedentary behaviour, and sleep. Retrieved from <http://csepguidelines.ca/>
- Chen, A. (2013). Top 10 research questions related to children physical activity motivation. *Research Quarterly for Exercise and Sport, 84*(4), 441-447. doi:10.1080/02701367.2013.844030
- Chen, A., Liu, Y., & Schaben, J. (2017). To move more and sit less: Does physical activity/fitness knowledge matter in youth? *Journal of Teaching in Physical Education, 36*(2), 142-151. doi:10.1123/jtpe.2016-0137
- 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.
- Coté, J., Horton, S., MacDonald, D., & Wilkes, S. (2009). The benefits of sampling sports during childhood. *Physical & Health Education Journal, 74*(4), 6-11.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- DiFiori, J. P., Benjamin, H. J., Brenner, J. S., Gregory, A., Jayanthi, N., Landry, G. L., & Luke, A. (2014). Overuse injuries and burnout in youth sports: a position statement from the American Medical Society for Sports Medicine. *British Journal of Sports Medicine, 48*(4), 287. doi:10.1136/bjsports-2013-093299
- Dishman, R. K., McIver, K. L., Dowda, M., Saunders, R. P., & Pate, R. R. (2015). Motivation and behavioral regulation of physical activity in middle school students. *Medicine & Science in Sports & Exercise, 47*(9), 1913-1921. doi:10.1249/MSS.0000000000000616



## Bioecological model - childhood physical activity - physical literacy journey

- DiStefano, L. J., Beltz, E. M., Root, H. J., Martinez, J. C., Houghton, A., Taranto, N., . . . Boyle, S. (2018). Sport sampling is associated with improved landing technique in youth athletes. *Sport Health, 10*(2), 160-168. doi:10.1177/1941738117736056
- 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. doi:10.1007/s40279-016-0560-7
- Elder, G. H., Jr. (1974). *Children of the great depression*. Chicago, IL: University of Chicago Press.
- Erwin, H., Abel, M., Beighle, A., Noland, M. P., Worley, B., & Riggs, R. (2012). The contribution of recess to children's school-day physical activity. *Journal of Physical Activity and Health, 9*(3), 442.
- Farrant, B. M., & Zubrick, S. R. (2012). Early vocabulary development: The importance of joint attention and parent-child book reading. *First Language, 32*(3), 343-364. doi:10.1177/0142723711422626
- Fenton, S. A. M., Duda, J. L., Quested, E., & Barrett, T. (2014). Coach autonomy support predicts autonomous motivation and daily moderate-to-vigorous physical activity and sedentary time in youth sport participants. *Psychology of Sport & Exercise, 15*(5), 453-463. doi:10.1016/j.psychsport.2014.04.005
- Figueroa, R., & An, R. (2017). Motor skill competence and physical activity in preschoolers: A review. *Maternal and Child Health Journal, 21*(1), 136-146. doi:10.1007/s10995-016-2102-1
- Fransen, J., Pion, J., Vandendriessche, J., Vandenborgh, B., Vaeyens, R., Lenoir, M., & Philippaerts, R. M. (2012). Differences in physical fitness and gross motor coordination in boys aged 6-12 years specializing in one versus sampling more than one sport. *Journal of Sports Sciences, 30*(4), 379-386. doi:10.1080/02640414.2011.642808
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Pearson/Allyn & Bacon.
- Garcia, J. M., Healy, S., & Rice, D. (2016). The individual, social, and environmental correlates of physical activity and screen time in Irish children: Growing up in Ireland study. *Journal of Physical Activity and Health, 13*(12), 1-28. doi:10.1123/jpah.2015-0659
- Goodway, J. D., & Robinson, L. E. (2015). Developmental trajectories in early sport specialization: A case for early sampling from a physical growth and motor development perspective. *Kinesiology Review, 4*(3), 267-278. doi:10.1123/kr.2015-0028
- 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.
- Healthy Active Living and Obesity Research Group. (2017). *Canadian Assessment of Physical Literacy: Manual for Test Administration* (2nd ed.). Ottawa, ON: Healthy Active Living and Obesity Research Group (HALO), Children's Hospital of Eastern Ontario Research Institute.
- International Physical Literacy Association. (2017). Physical Literacy. Retrieved from <https://www.physical-literacy.org.uk/>
- Jayanthi, N., LaBella, C. R., Fischer, D., Pasulka, J., & Dugas, L. R. (2015). Sports-specialized intensive training and the risk of Injury in young athletes: A clinical case-control study. *American Journal of Sports Medicine, 43*(4), 794-801. doi:10.1177/0363546514567298

## Bioecological model - childhood physical activity - physical literacy journey

- Jayanthi, N., Pinkham, C., Dugas, L., Patrick, B., & LaBella, C. (2013). Sports specialization in young athletes: Evidence-based recommendations. *Sports Health, 5*(3), 251-257. doi:10.1177/1941738112464626
- Krueger, R. A., & Casey, M. A. (2015). *Focus groups: A practical guide for applied research* (5th ed.). Thousand Oaks, CA: SAGE Publications.
- Lloyd, M., Saunders, T. J., Bremer, E., & Tremblay, M. S. (2014). Long-term importance of fundamental motor skills: a 20-year follow-up study. *Adapted Physical Activity Quarterly, 31*(1), 67-78. doi:10.1123/apaq.2013-0048
- Longmuir, P., Boyer, C., Lloyd, M., Yang, Y., Boiarskaia, E., Zhu, W., & Tremblay, M. S. (2015). The Canadian Assessment of Physical Literacy: methods for children in grades 4 to 6 (8 to 12 years). *BMC Public Health, 15*(1), 767-778. doi:10.1186/s12889-015-2106-6
- Longmuir, P., & Tremblay, M. S. (2016). Top 10 research questions related to physical literacy. *Research Quarterly for Exercise and Sport, 87*(1), 28-35. doi:10.1080/02701367.2016.1124671
- Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research* (6th ed.). Thousand Oaks, CA: SAGE Publications.
- Nobre, F. S. S., Coutinho, M. T. C., & Valentini, N. C. (2014). The ecology of motor development in coastal school children of Brazil northeast. *Journal of Human Growth and Development, 24*(3), 263-273.
- O'Dwyer, M. V., Fairclough, S. J., Knowles, Z., & Stratton, G. (2012). Effect of a family focused active play intervention on sedentary time and physical activity in preschool children. *International Journal of Behavioural Nutrition and Physical Activity, 9*(1), 1-13. doi:10.1186/1479-5868-9-117
- ParticipACTION. (2018). *The ParticipACTION report card on physical activity for children and youth*. Toronto, ON: ParticipACTION.
- Pawlowski, C. S., Schipperijn, J., Tjørnhøj-Thomsen, T., & Troelsen, J. (2018). Giving children a voice: Exploring qualitative perspectives on factors influencing recess physical activity. *European Physical Education Review, 24*(1), 39-55. doi:10.1177/1356336X16664748
- Pujadas-Botey, A., Bayrampour, H., Carson, V., Vinturache, A., & Tough, S. (2016). Adherence to Canadian physical activity and sedentary behaviour guidelines among children 2 to 13 years of age. *Preventive Medicine Reports, 3*(2016), 14-20. doi:10.1016/j.pmedr.2015.11.012
- Rhodes, R. E., & Lim, C. (2018). Promoting parent and child physical activity together: Elicitation of potential intervention targets and preferences. *Health Education & Behavior, 45*(1), 112-123. doi:10.1177/1090198117704266
- Sterdt, E., Liersch, S., & Walter, U. (2014). Correlates of physical activity of children and adolescents: A systematic review of reviews. *Health Education Journal, 73*(1), 72-89. doi:10.1177/0017896912469578
- Strutz, E., Browning, R., Smith, S., Lohse, B., & Cunningham-Sabo, L. (2018). Accelerometry-derived physical activity correlations between parents and their fourth-grade child are specific to time of day and activity level. *Journal of Physical Activity & Health, 15*(6), 440-447. doi:10.1123/jpah.2016-0645
- Suton, D., Pfeiffer, K. A., Feltz, D. L., Yee, K. E., Eisenmann, J. C., & Carlson, J. J. (2013). Physical activity and self-efficacy in normal and over-fat children. *American Journal of Health Behavior, 37*(5), 635-640. doi:10.5993/AJHB.37.5.7

## Bioecological model - childhood physical activity - physical literacy journey

- Tercedor, P., Segura-Jiménez, V., Ávila García, M., & Huertas-Delgado, F. J. (2019). Physical activity during school recess: A missed opportunity to be active? *Health Education Journal*, 78(8), 988-999. doi:10.1177/0017896919859044
- Timo, J., Sami, Y.-P., Anthony, W., & Jarmo, L. (2016). Perceived physical competence towards physical activity, and motivation and enjoyment in physical education as longitudinal predictors of adolescents' self-reported physical activity. *Journal of Science and Medicine in Sport*, 19(9), 750-754. doi:10.1016/j.jsams.2015.11.003
- Tudge, J. R. H., Payir, A., Merçon-Vargas, E., Cao, H., Liang, Y., Li, J., & O'Brien, L. (2016). Still misused after all these years? A reevaluation of the uses of Bronfenbrenner's bioecological theory of human development: Bronfenbrenner's theory: Still misused? *Journal of Family Theory & Review*, 8(4), 427-445. doi:10.1111/jftr.12165
- Whitehead, M. (2001). The concept of physical literacy. *European Journal of Physical Education*, 6(2), 127-138. doi:10.1080/1740898010060205
- 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. doi:10.1080/17511320701676916
- Whitehead, M. (2010a). The concept of physical literacy. In M. Whitehead (Ed.), *Physical literacy, throughout the lifecourse* (pp. 10-20). London, UK: Routledge.
- Whitehead, M. (2010b). *Physical literacy, throughout the lifecourse*. London, UK: Routledge.
- Yoon, H. J., Lee, S. A., Ju, Y. J., Nam, J. Y., & Park, E. C. (2018). The relationship between physical activity level of parents and that of their adolescent children. *Journal of Physical Activity and Health*, 15(8), 613-619. doi:10.1123/jpah.2017-0123