

ADDRESSING DROP OUT IN SPORT IN YOUNG CANADIANS AND HOW TO CHANGE
OUR APPROACH THROUGH PHYSICAL LITERACY CONCEPTS

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Abstract

There has been a decreasing trend in exercise, physical activity time, and sport participation in Canada over the past 15 years. Interpersonal constraints, such as perceived competency, has been noted as one of the foremost causes of drop out. The importance of teaching fundamental movement skills (FMS) to increase perceived competency is explored in relation to our current approaches. Addressing the language of sport, a male-dominated discourse provides an understanding of limited sport and physical activity participation in females and non-European non-English speaking Canadian immigrants. Through exploring the BC Curriculum and teachers experiences in Physical and Health Education in elementary schools in BC, recreation and sport programs are filling in the holes of physical education outside of schools. An examination of the Canada Sport for Life physical literacy program for coaches and instructors shows a first step in progressing Canada to become a physically literate nation. This paper concludes with the need to educate our teachers, coaches, and instructors on the reasons behind dropout and changing our approaches to increase FMS, perceived competency, and inclusion for the culturally changing demographics of Canada.

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Part 1: The problem

Current Trends in Canadian Children's Physical Exercise

Physical activity, exercise, and physical fitness have become an issue of importance in recent years with the rise of sedentarism in our society. Physical activity, as defined by Caspersen et al. is “any bodily movement produced by skeletal muscles that results in energy expenditure” which can be measured in kilocalories and can be categorized into occupational, sports, conditioning, household, or other activities (Caspersen, Powell, & Christenson, 1985). Exercise is “a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness” while physical fitness has “attributes that are either health- or skill-related (ibid, 1985).

Research over the past decade has shown that exercise time and sport participation have been decreasing in the Canadian population, while sedentarism has been increasing (ParticipAction, 2016). A report from Statistics Canada shows that the average number of sedentary minutes spent by children between the ages of 7 and 14 per day is 500, while the average minutes of light physical activity spent a day totals 253, and their average vigorous physical activity is 59 minutes a day (Larouche, Garriguet, Gunnell, Goldfield, & Tremblay, 2016). Another study conducted between 2009 to 2014 examining children between the ages of three and four estimates that average sedentary time is 458 minutes a day (Garriguet, et al., 2016). This data was collected through a mobile examination centre which used accelerometer measurements, n=865 participants aged between 3 to 5. Light physical activity averaged 211 minutes a day and moderate-to-vigorous physical activity (MVPA) averaged 75 minutes a day while screen time for the three to five-year-old averaged approximately two hours a day (ibid, 2016). In short, children aged three to fourteen are averaging between 7.2 and 8.3 hours a day, respectively, of sedentary

behaviour each day, while their physical activity appears to be slightly more than one hour a day. It is paramount to note that “residents of First Nations Reserves, institutions, some remote regions, or areas with low population density, and full-time members of the Canadian Forces were excluded” from these studies, while the authors note that their “sample represented more than 96% of the Canadian population” (Garriguet, et al., 2016, p. 15). This data therefore is best representative of Canada’s urban child population, where the authors conclude that an estimated 70% of three to four years old and 30% of five years old children in Canada are meeting their respective physical activity recommendations (ibid, 2016).

Physical activity guidelines published by the World Health Organization and Canadian Health Authority both recommend 60 minutes a day of MVPA (Colley, et al., 2017) (World Health Organization, 2011). A 2017 Statistics Canada study indicates that the difference of operationalizing their recommendation of 60 minutes a day as an average, “rather than requiring 60 or more minutes on at least 6 out of 7 days results in a difference in the percentage of children and youth who meet the guideline of 7% versus 36%” affects the interaction of statistical analysis for the report changed, depending on how the MVPA was operationalized when “at least 60 minutes per day when averaged across a week, at least 60 minutes on all 7 days of the week, or at least 60 minutes on at least 5 or at least 6 days per week” were used as measurements of MVPA (Colley, et al., 2017, p. 8). Over a four-cycle collection period, where Cycle 1 (2007-to-2009; n = 1,473), Cycle 2 (2009-to-2011, n = 1,507), Cycle 3 (2012-to-2013, n = 1,328), and Cycle 4 (2014-to-2015, n = 1,300) boys and girls aged 6 to 11 averaged 69 and 57 minutes per day of MVPA, respectively in Cycle 1; 61 and 47 minutes, respectively, in Cycle 2; 72 and 58 minutes, respectively, in Cycle 3; and 72 and 52 minutes, respectively, in Cycle 4 (figure 1) (Colley, et al., 2017). Boys and girls aged 12 to 17 averaged 59 and 42 minutes, respectively, in

Cycle 1; 49 and 39 minutes, respectively, in Cycle 2; 56 and 43 minutes, respectively, in Cycle 3; and 55 and 40 minutes, respectively, in Cycle 4 (Colley, et al., 2017). Of note is that children in Cycle 1 who were aged 6 to 11 would have advanced in age and been in the 12 to 17 age-bracket for Cycle 4, indicating that as the boys aged they decreased their average MVPA from 69 minutes to 55 minutes (12.7% decrease), while girls decreased their MVPA time from 57 minutes to 40 minutes (29.8% decrease) (figure 1). Although boys are still reaching the target MVPA minutes in a day, girls are on average 20% below the recommended level.

A 2016 report card from ParticipAction provides Statistics Canada's MVPA numbers for children, as reported above, stating that “for optimal health benefits, children and youth (aged 5-17) should achieve high level of physical activity, low levels of sedentary behaviour, and sufficient sleep each day”, and that a “healthy 24 hours” includes activities that adhere to their outlined Sweat, Step, Sleep, and Sit (ParticipAction, 2016, p. 7). “Sweat” is described as resulting from “an accumulation of at least 60 minutes per day of [MVPA] involving a variety of aerobic activities. Vigorous physical activities, and muscle and bone strengthening activities should each be incorporated at least 3 days per week”; “Step” is described as light physical activity, including “several hours of a variety of structured and unstructured light physical activities”; “Sleep” as “uninterrupted 9 to 11 hours of sleep per night for those aged 5-13 years and 8 to 10 hours per night for those aged 14-17 years, with consistent bed and wake-up times”; and “Sit” described as “no more than 2 hours per day of recreational screen time; limited sitting for extended periods of time” (ibid, 2016, p. 7). The new 24-hour guideline is a clear movement away from the guideline of 60 minutes a day averaged across seven days a week, five out of seven days a week, or weekdays, which would improve the operationalizing of the statistics. This

method should improve our statistical analysis and understanding of exactly how children are meeting physical activity guidelines.

Another ParticipAction report states that “70% of children aged 3 to 4 meet the recommendation of 180 minutes of daily activity at any intensity”, that “14% of 5-11 year olds [sic], and 5% of 12-17 year olds [sic] are meeting the guidelines”, while also highlighting that “only 9% of Canadian kids get the 60 minutes of heart-pumping physical activity they need each day” (Figure 2) (ParticipAction, 2016, p. 15). Upon reading the ‘research gaps’ of the mentioned statistics, ParticipAction calls for “more research... to determine what impact there will be on behaviours of children and youth as the move is made to implement the 24-hour integrated movement guidelines” (ibid, 2016, p. 16). In theory, implementing a new strategy of physical activity sounds promising; however, the Statistics Canada reports that are being created note the inconsistencies of the recommended days out of the week and how this skews the data being represented. What appears to have happened was an inconsistent exercise guideline was implemented, and the statisticians could not appropriately analyze the data to provide a clear indication of how the guidelines affected the population. Stephen McGinly, a lecturer in the Department of Curriculum and Pedagogy at UBC, stated that the ParticipAction guidelines are being integrated in the teacher’s education in the newly implemented curriculum (McGinley, 2018), indicating that the new 24-hour integrated movement guidelines are already being implemented into the BC education system which should show statistical results in the next five years. This shift may change statistical analyses, however, physical activity levels in Canada are still decreasing as children get older, indicating that a behavioural change also requires addressing.

Teachers, coaches, and physical activity instructors are at the front lines of educating children on how to move. Although not the focus of this paper, parents also have an important role in teaching these skills. Human variation drastically affects the ways in which instructors approach their class, as some children can learn specific topics faster or movements easier/faster than others. Jamie Strashin of CBC writes that by approximately age 13, children have moved away from an active lifestyle, a change which "...can't simply be chalked up to laziness, video games or 'kids these days'" (Strashin, 2016). For children, interpersonal reasons such as lack of enjoyment and lack of competence, along with intrapersonal constraints from pressure, time constraints, social priorities, injury and cost have been noted as the biggest reasons for children dropping out of sport (Crane & Temple, 2015). Overtraining and burnout in young athletes is a new topic of discussion as these concepts have primarily been studied in adults; hence for the purpose of this paper, this will be discussed as early specialization where children are becoming too specialized in one skill set and not learning a variety of skills to enhance their movement abilities (Winsley & Matos, 2011).

This paper will explore the complex phenomenon of dropout in sport and decrease in exercise time which increases inactivity. Through an understanding of interpersonal and intrapersonal constraints children face when involved in sport, an exploration of the importance of fundamental movement skills will be addressed with reference to increasing perceived competency. Canada is a country built upon immigration, and as such, more than a single cultural discourse towards physical activity is required. In defining our language of sport in reference to how we view the body and athlete, the need to include a non-masculine dominated discourse is addressed to increase participation in females. The BC Curriculum on Physical and Health Education in elementary schools will explore moving towards physical literacy in schools

and how teachers are managing the changes. A case study of three competitive swimmers from Edmonton will provide a foundation for understanding that sport can have room for recreation to high-performance, but also that learning fundamental movement skills at an early age impacts our ability to perform. Lastly, an examination of the Canada Sport for Life Physical Literacy Program highlights the benefits and shortfalls of our programs targeting children's FMS learning. This paper will conclude with recommendations on how teachers, coaches, and instructors can better approach children at a younger age through the philosophies of physical literacy to increase their FMS competency, enhance their experience in exercise programs, and increase physical activity levels of children at an older age.

Interpersonal and Intrapersonal Constraints to Learning Fundamental Movement Skills

For many Canadian children, participation in sport is an important method of getting their daily physical activity needs while also gaining many benefits of engagement in sport. However, as noted by ParticipAction “organized sport may be too focused on winning to the detriment of having fun, which is in line with reports that 73% of Canadian parents agree that ‘sports have become too focused on winning’” (ParticipAction, 2015, p. 18). A review of

...43 international studies representing nearly 470,000 5- to 19-year-olds and found that structural constraints (e.g., time, injuries, cost, inadequate facilities) are not the leading reasons why children and youth drop out of sport. Rather, dropout is largely due to a lack of enjoyment, low perceived competence and an increase in family and intrapersonal pressure (e.g., stress) [(Crane & Temple, 2015)] (ParticipAction, 2015, p. 18).

Of five identified intrapersonal constraints to dropout in youth sport, Crane and Temple (2015) found that “a lack of enjoyment and low perceptions of physical competence were most frequently identified”, they cited 14 studies that measured the constructs such as ‘not having fun’, ‘being bored’, and perceptions of low physical competency as important correlates of dropout (Crane & Temple, 2015, p. 8). Other intrapersonal reasons for dropout in sport were related to intrinsic pressures, including “perceptions of negative team dynamics” from coaches and team mates, and two factors associated with maturation: “(a) disadvantage associated with chronological age grouping in sport or the ‘relative age effect’, and (b) the individual becoming too old or big to participate” (Crane & Temple, 2015, p. 8). Taking perceived competence as one of the most highly identified reasons for dropout, the exploration of how to increase perceived skill competency must be addressed.

Fundamental Movement Skills (FMS) are the building blocks to movement and can be metaphorically understood in the same way the alphabet is required to make sentences (Pardiwala, 2018). Perceived competence refers to “an individual’s perception of their actual motor proficiency”, indicating that the perceptions of children having a lack of physical competence is in direct relation to their ability to perform motor commands taught through FMS (Lubans, Morgan, Cliff, Barnett, & Okely, 2010, p. 1023). A six-year longitudinal study examined whether perceived sport competence mediated the relationship between childhood motor skill proficiency and adolescent physical activity where N=481, 276 females and 205 males mean age 16.4 ± 2.1 years, were measured (Barnett, Morgan, Beurden, & Beard, 2008). The researchers summarized that “object control skill proficiency as a child appears important in developing a positive perception of competence in sports and seems to combine to increase physical activity and fitness outcomes as an adolescent” (Barnett, Morgan, Beurden, & Beard,

2008, p. 10). FMS becomes, therefore, not just the foundation to skill movement, but also to sport and exercise participation, and will be explored in greater detail later in this report.

Perception is defined as “the neurophysiological processes, including memory, by which an organism becomes aware of and interprets external stimuli” (Oxford Dictionary 4, 2018).

Fundamentally, a child’s perceived competency in physical activity and sport relates to the intrinsic association they have with the movements they make in the activity or sport they participate in. The teacher, coach, or instructor therefore becomes the gateway to learning movements for the child and is responsible not just for the child’s basic understanding of FMS, but also in fostering a positive perception of the child’s skill level. Perceptions of negative team dynamics, for example, could be attained through the observation that a coach considers one child as more *athletic* than another, comparisons the child makes with other individuals, or other individuals commenting back to the child.

Coaches, when describing individuals on their team tend to use the term *athletic*, defined as the attributive of *athlete* defined as “a person who is proficient in sports and other forms of physical exercise” (Oxford Dictionary 1, 2018). For a coach to establish a sense of athleticism, a foundational definition of the term must be understood, and this in turn relates outwards towards those they are teaching. Therefore, a teacher, coach, or instructors’ preconceived notion of what an *athlete* is can develop in a child a perception of lack of physical competence through the instruction received, interaction with the teacher, coach, or instructor, or through comparisons they make with others. For example, if a coach tells a child that they are less athletic than another child in the group, or that they need to become more athletic, the child will make a comparison and find the definition of the word to mean that they lack the proficiency of the skill required. Their comparison of their skill to that definition and comparisons with others in their group will

impact their perceived level of physical ability. Therefore, it is the responsibility of the teacher, coach, or instructor to ensure that the skill level gap of their group between children is kept to a minimum, but also that the language used to describe the competency of a child is heavily considered to invoke positive intrinsic competency.

Malina (1996) has laid the claim that a child's physical confidence can be increased through FMS to lay the foundation for long term physical activity, while Whitehead (2010) states that a multitude of research has shown that FMS "are strongly associated with physical activity participation" (p. 111). However, one longitudinal study provided evidence to the contrary and showed that measures of "agility and locomotion (lateral jumping), eye-hand coordination or manipulation (catching a ball), and stability (balancing on one foot)" were not predictors of physical activity at age 12 (McKenzie, et al., 2013, p. 239). This study, however, also states that there "are several alternative explanations" as potential reasons their results did not prove to show a positive relationship, citing too many intervening factors in a child's development, too few skills selected for measurement, and a restriction of age indicated that children's development and participation in physical activities at an older age is attributed to a large collection of processes (ibid, 2013. p. 243). FMS can therefore be understood as not a single factor in dictating a child's participation in physical activity at an older age; however, it cannot be denied that FMS plays an important role.

The act of competing is to compare results, and as sport-acts are performed with our bodies, we are comparing the movements of one body to another. Performance becomes the ability to execute these sport-acts at an ever-increasing level, which ultimately dictates the social surroundings of those involved in competitive sport. Perceived competence is directly linked on comparisons with our social surroundings, which in sport is determined by performance.

Therefore, a child's lack of perceived competence in sport arises from the comparisons they make of themselves to others in their performance. The importance of learning FMS which develops sport specific skills is in direct relation to this competency.

Margaret Whitehead notes that a number of different definitions can be used to describe FMS such as perceived sports competence and motor proficiency; however, all fundamentally refer to the same concept (Whitehead, 2010, p. 111). In sport, these terms can be defined as Key Performance Factors (KPF). In competitive swimming, the National Coaching Certification Program for Swimming (NCCP-Swimming) Level 1 takes coaches through identification of the KPFs for the four strokes, where approximately 180 KPFs on technique are defined (NCCP-Swimming, 2012). These ~180 KPFs represent only the strokes, and do not pertain to the dive/start, turn (of which there are five), finish, or race tactics/strategies. In total, it can be approximated that swimming has 300 to 350 KPFs or FMS. In order to take NCCP-Swimming Level 3 (coach at the national level), coaches are required to complete a multitude of multi-sport modules, including *Developing Athletic Abilities*. *Athletic abilities*, as defined in the course material, "refers to the capacity to carry out the efforts, movement, or tasks that support performance in sport" and can be grouped into physical, motor, tactical, and mental (Coaching Association of Canada, 2008). With the aforementioned module focusing on physical and motor athletic abilities, the physical abilities are broken down into aerobic stamina, flexibility, speed, speed-endurance, speed-strength, strength-endurance, maximum strength; while the motor athletic abilities are broken down into agility, balance, and coordination (ibid, 2008, p. 2). In short, coaches have to teach children hundreds of KPF/FMS to create athletic abilities to perform a sport, especially at a higher level of performance. Children who do not learn these KPF/FMS either early enough or quick enough can have reduced performance and perception of

competency which ultimately affects their participation in sport. The Physical Literacy Program, created by Canadian Sport For Life, addresses this problem and will be explored in greater detail later in this paper.

Interpersonal constraints such as pressure, having external commitments to sport, social priorities, and structural constraints such as time, injuries, cost, and organizational problems were also cited as factors leading to drop out (Crane & Temple, 2015). The systematic review noted that "...not enough playing time or opportunities, dissatisfaction with the coach and too much training time" were the most commonly attributed qualities of describing lack of enjoyment or fun (ibid, 2015, p. 123). Not enough playing time would be attributive of coach choice or coach performance demands, while too much training time can relate to early specialization or other social priorities that interfere with meeting the training demands.

Therefore, it is paramount that as a teacher, coach, or instructor not only are FMS understood and taught appropriately, but that the interactions of the teacher, coach, or instructor towards the participant is non-comparative to other athletes, students, or participants in order to decrease comparative perceptions within the individual. These leaders are also responsible for following the Long Term Athletic Development Model (LTAD) and ensuring that children are engaging in age-appropriate competitions. Limitations of the LTAD include a focus on developing children who can participate in a multitude of sports and not become specialized until a later age. With sport being focused on performance, early specialization is a requirement to reach these performance goals. Coach performance demands and overtraining at a young age need to follow the LTAD to reduce early specialization, while parents who enroll their children in sport should be educated to understand the demands of their sport to decrease misunderstandings about expectations. Explored later in this paper is an example of a swim program, the Edmonton

Keyano Swim Club, that shows a sport program that is able to offer both performance and non-performance driven sport. If the sport team does not provide a participant with an appropriate avenue for participation, then structural constraints must be addressed. Although structural constraints have not been cited as a leading cause of drop out (Crane & Temple, 2015), negative team dynamics such as not enough playing time and too many practices are scenarios created through coach decisions.

Through the exploration of language, the communicative interactions of the teacher, coach, or instructor have an effect on a child's ability to make comparisons about their competency with other children in their groups. The leader must understand this concept and how it relates to the fundamental building of a child's FMS. FMS and increasing perceived competency must be the focus of the lessons provided to children at a young age. Teachers, coaches, and instructors must also be educated to understand that Canada has more than one cultural discourse.

Canadian Multiculturalism and Masculinity in Sport, Exercise, and Athleticism

Canada is a multicultural nation, and as such, it must be recognized that different cultures define and value the body and exercise in different ways. For a parent or person new to instructing physical exercise, they are guided through the ParticipAction's 24-hour guideline of "several hours of a variety of structured and unstructured light physical activities" each day (ParticipAction, 2016, p. 8). The guidelines, which define moderate-intensity activities as causing "children to sweat a little and breathe harder, you should still be able to talk, but not sing" and vigorous-intensity activities as causing "children to sweat and be out of breath [sic], it will be almost impossible to carry on a conversation", may cause unintentional exclusion of

participants from other cultures (ParticipAction, 2016, p. 8). For example, sweat in Traditional Chinese Medicine (TCM) is view the pores as “dangerous avenues of contagion...” where “winds were to be avoided after exertion when sweat poured out through open pores for they could enter and, if unchecked, sink ever deeper into the major conduits of the body causing increasingly serious ailments” (Jette & Vertinsky, 2011, pp. 276, 277). Viewing the open pores as potential avenues of contagion may have an impact on those that follow cultural beliefs on limiting sweat encounters. This contrast to Western views on sweating does not align with the ParticipAction guidelines, nor with many studies regarding MVPA, and may cause a disconnect with some communities. These recommendations are culturally appropriate for a non-TCM approach to exercise, however, if ParticipAction is setting guidelines that are being followed in schools; their guidelines need to be culturally inclusive when addressing exercise, physical activity and sport.

A systematic review of physical activity among South Asian women immigrants living in Birmingham, UK, found that “although there was a general awareness” of the health benefits to physical activity, “five studies reported that there was confusion as to what types and how much PA [physical activity] to perform as well as confusion about specific health benefits” (Babakus & Thompson, 2012, p. 10). The authors noted that other barriers included mixed-sex facilities such as swimming pools, the use of male instructors, difficulties speaking English, community stigma such as “taking time to participate in personal physical activity as a selfish act”, and beliefs held by some that women “should perform domestic duties over all other activities” (ibid, 2012, p. 10, 14). In 2016, “immigrants came to Canada from over 190 countries” (figure 5) where “the Philippines and India were the top source countries” accounting for 28% of the total intake in 2016” (The Canadian Magazine on Immigration, 2017). The South Asian community is

a relevant and important topic of discussion when discussing exercise trends and must be included in guidelines for physically active Canadians in either sport or exercise programs.

In a Canadian Heritage Sport Participation 2010 research paper providing breakdowns of sport participation by languages spoken, a decreasing trend is seen from 1992 through 2010 in those that speak multiple languages and French (figure 3) (Government of Canada, 2013). English “sport participation rates remained stable; between 30% and 29%” however, “Francophone and multiple-language speakers fell by 9%” between 2005 and 2010 (Government of Canada, 2013, pp. 23-24). For Canadian born and immigrants before 1991, the same trend was seen (Figure 4) where both groups decreased from 19% participation in 2005 to 16% participation in 2010 (ibid, 2013, p. 24). Female sport participation is drastically lower in comparison to male sport participation for immigrants where recent immigrant (2004 to 2010) total percentage of sport participation was 27.7% from a combined male 38.0% and female 17.4% (ibid, 2013, p 28). These numbers decrease the longer a female immigrant has been in Canada, where immigrants from 1990 to 2004 have a male rate of 44.4% and a female rate of 15.3%, and immigrants prior to 1990 have a male rate of 22.7% and a female 8.7% (ibid, 2013, p. 28). This information can be interpreted as either the longer an immigrant female is in Canada, the less they engage in sports, or that younger female immigrants from 1991 to 2000 and 2001 to 2005 value sport more than immigrants before 1991 and Canadian born. Statistics Canada reports that in 2011 “immigrant children aged 14 and under who came in the last five years accounted for 19.2%... another 14.5% were between the ages of 15 and 24” and that 58.6% were between 25 and 54 (Statistics Canada, 2011). This indicates that the decrease in female sport participation is most likely due to age, indicating that older female immigrants are disconnected from sport. However, ‘very recent immigrant’ females also show a decline in sport participation lower than both 1991 to 2000 and

2001 to 2005. This extremely complex issue may in part be due to increasing trends in non-European immigrants to Canada and not only increasing South-Asian immigrants, but increasing Eastern Asia, Caribbean and Bermuda, Central and South America, Northern Africa and Western Asia and Middle East (Figure 9) (Statistics Canada, 2016). It would be more useful for Statistics Canada to provide immigrant sport participation rates based on country of origin or geographical location on a continent (such as North Africa, South Asia, East Asia) and number of years lived in Canada for better interpretation. To prevent this dramatic decrease, reasons for female drop out must be explored.

Social pressures such as gender stereotypes have been cited as a reason for females to drop from sport where “girls revealed that they felt pressure to be feminine and if they perceived that the sport prevented them from being feminine they were more likely to drop out” (Crane & Temple, 2015, p. 124). Noteworthy is a study exploring the expectancy-value model of Eccles and colleagues investigating the effect of gender role orientation on the psychological dimension of female athletes’ sport participation (Guillet, Sarrzazin, Fontayne, & Brustad, 2006). In the study, 333 female handball players found that their perceived competence and value of activity in relation to gender role orientation was a predictor of sport drop out (ibid, 2006). Guillet et al. concluded that

players high in masculinity tended to perceive themselves as more competent and tended to more highly value the activity. Moreover, femininity orientation was negatively related to perceived competence in that the more the players had a stronger femininity orientation, the less they perceived themselves to be competent in the activity (Guillet, Sarrzazin, Fontayne, & Brustad, 2006, p. 21)

The more masculine females perceived themselves to be in relation to the activity they were doing, the more highly they valued the activity. This does not mean the female athletes are any less feminine, nor do they feel any less feminine; to the contrary, these athletes identify themselves as being both highly feminine and highly masculine (ibid, 2006). Although this is a single study in the area, with limitations of the sport selection (handball), and their limited variables, the construct does pose to be a concern for teachers, coaches, and instructors regarding how they approach teaching physical activities. Regarding immigration, the inherent masculinity of sport may be a method of exclusion for those from a changing cultural background from previous years in Canadian history (Figure 9), specifically with cultures where female domestic duties are traditionally recognized to be more important than all other activities (Babakus & Thompson, 2012). Leaders of exercise programs therefore need to address the masculinity dominated narrative of sport, which as stated previously, can be done by not using the term *athlete* to define those learning sports skills explored in Part 2 of this paper.

If identity and perceived competency are related to one another when discussing participation in sport, those teaching children FMS should have an understanding about the social implications of the activity. Stephen McGinley stated that there is currently a “move away from the ‘hall of shame sports’ like dodgeball” in schools, and more of a move towards Teaching Games for Understanding (TGFU) (McGinley, 2018). In examining the UBC’s Health and Physical Education blog on class resources, we find that TGFU advocates teaching games, rather than sport-specific units, where children learn skills to apply to different sports through playing games (UBC Physical and Health Education, 2017). TGFU uses four varying game types: Target Games to teach golf/bowling; Net/Wall Games to teach badminton, squash, tennis etc.; Striking/Fielding Games to teach baseball, cricket, softball etc.; and Territory Games to teach

basketball, goalball, handball, hockey, soccer etc. (ibid, 2017). Nakita Pardiwala, a secondary Physical and Health Education teacher from Salt Spring Island, stated she was taught that FMS can be better taught to children in the form of a game and uses this in her senior school classrooms (Pardiwala, 2018). The NCCP-Swimming Level-1 course has also expressed this notion of teaching children through games in the sense of “make learning fun”, and directs coaches to focusing on skill acquisition through games as opposed to mundane drills (NCCP-Swimming, 2012). The TGFU approach “provides a learner-centred approach that puts the needs and abilities of the participants first over the importance of the game” (Mandigo, Butler, & Hopper, 2007, p. 14). The ‘Hall of Shame’ sports for McGinley are sports that single kids out through their athletic abilities, and those who are winners tend to be the most athletic of the crowd whereas those less athletic or interested end up sitting out (McGinley, 2018). The removal of ‘Hall of Shame’ sports from gym classes should have an effect on the capacity for children to identify with the activity they are participating in as those most highly skilled no longer become the centre of entertainment while everyone else sits on side not participating. This focus on the teaching of skills through games should increase competency in children which should increase competency in sport and participation later in life (Lubans, et al., 2010) (McKenzie, et al., 2013). Although these studies are done on predominantly European descendants, human improvement in skill acquisition and motor development should be transitional across the human species and not specific to geographical upbringing.

In sport, however, coaches may have difficulty not focusing on performance as sport is inherently competitive. The CBC satirical Radio Show *This is That* published on their twitter account that “to ensure every child ‘wins’, Ontario athletic association removes ball from soccer” (@CBCThisIsThat, 2013). The satire relates to the discussion about cultivating a love of sport in

children because every sport is a comparison of one team or individual to another and we cannot remove the competitive nature of sport in order to increase participation. This is not to say that competition is good nor bad, but that we must address the approach we take to teaching children in sports about the nature of what they are doing. These concepts can relate to intrinsic and extrinsic motivation, where extrinsic motivation has been related more predominantly with negative affect (Roberts, Treasure, & Conroy, 2007). This paper's focus is not on sport psychology, and therefore these concepts are beyond the scope of this paper; however, it is worth noting that motivational factors do play a role in sport and physical activity participation along side competency. Teachers, coaches, and instructors therefore need to be aware that their athletes should be intrinsically motivated (centered on themselves) and not extrinsically motivated (focused on comparisons to others or on outcomes). The focus, in the soccer example, should therefore not be on keeping score, but on the processes needed to get the ball to the other end of the field to set up a shot to potentially score.

Therefore, when addressing participants that are of a non-European descent, teachers, coaches, and instructors need to be culturally appreciative, accepting, and accommodating in teaching FMS. Using the TGFU method can remove the performance focus for younger children to focus on their skills, potentially having a psychological affect on motivation, however this will require further research. Female immigrants may not participate because of social and cultural traditions in their native country, and the Canadian value of creating a cultural mosaic of integration should allow them to maintain their cultural identity within Canada. Therefore, our guidelines need to provide a culturally appropriate method for them to be engaged in physical activity in non-traditional ways. However, the language we use in sport is inherently masculine, and females participating in Canadian sport may be pushed away from not being able to identify through lack

of masculinity. Looking to language, the way we speak about our body, and those involved in sport may have a profound affect on increasing competency.

Part 2: Using Physical Literacy as a Common Thread, Strengths and Weaknesses

Linguistic Relativity and Moving from *Athlete* to *Physically Literate*

Margaret Whitehead cites Weiss and Harber 1999 to explore embodiment through an anecdote in which a Western anthropologist explains the concept of *the body* to a New Caledonian philosopher whose response was ‘what you’ve brought us is *the body*’ (Whitehead, 2007, p. 292). Linguistic relativity, in this anecdote, provides a pathway of understanding how language shapes our understanding of our experiences. Whitehead also notes the differences of Chinese language from English in the concept of *body* being defined by three words: “*shen*, the animate body as lived; *ti*, the inanimate body, used as an instrument; and *shi*, the dead body or corpse” while in Western society “...embodiment in the context of its contribution to human existence would seem to align particularly with *shen*” (ibid, 2007, p. 293). Embodiment as described by Whitehead fits more in line with *ti* and does not associate with the body/mind dualism in Western culture, and she argues that “the articulation of an understanding of our body-as-object undeniably forms an integral part of contemporary attitudes to physical activity” (ibid, 2007, pp. 293-294). Whitehead creates this argument by citing Jean-Paul Sartre’s opinion that “Sartre acknowledges that our embodied capacities are inherently part of our human condition and writes that ‘for human reality, to be is to act’” (ibid, 2007, p. 283). Understanding the construct of *body* in the English language, therefore, becomes integral to our understanding of how we interact with not just our physical body as a mechanism for physical activities, but how we view the meaning behind body’s interaction with ourselves.

The tools of language are an important component of social interaction which are “structurally overdetermined through their rich meanings and multiple functions”. This proposes that “the language you speak makes a difference in the social actions you can perform” (Sidnell & Enfield, 2012, pp. 320-321). An individual’s social reality, therefore, is created through the social agency of their language (Enfield, 2015). The word *body* in English has been defined as “the organized physical substance of an animal or plant either living or dead” (Merriam-Webster, 2018), “the physical structure, including the bones, flesh, and organs, of a person or an animal” (Oxford Dictionary 3, 2018), or “the whole physical structure that forms a person or animal” (Cambridge University Press, 2018). The term *body* in English can also be used to describe a body of water, the body of an aircraft, or a body of people (Oxford Dictionary 3, 2018).

Therefore, in English, the term *body* signifies physical structures, inherently separate of any connection outside what we can see. When conversing in English, it is the way in which the sentence is structured that we are able to discern how we are speaking about *body*; however, we are always speaking of a physical object. Whitehead proposed the use of the word *embodiment* or *embodied* to move culturally and scientifically away from the term *body* will enable “...every child to reach his/her potential; providing each with the experiences and knowledge that will make a lasting legacy in respect of quality of life in all its dimensions”, and by moving away from “the dualistic attitudes that persistently cast embodiment as inferior and worthy of attention only as an object to be kept fully functioning” (Whitehead, 2007, p. 295). Moving away from the body/mind dualism can allow us to see our body as part of ourselves, not a physical vessel for use, and allow us to be less focused on increasing its attributes to perform an action but to enhance our experiences.

The word *athletic* has been previously defined as “physically strong, fit, and active” (Oxford Dictionary 2, 2018); and *athletic* is also an attributive of *athlete*, defined as “a person who is proficient in sports and other forms of physical exercise” (Oxford Dictionary 1, 2018). Examples of sentences provided by Oxforddictionary.com that use the word *athletic* include “usually lean, they have strong bodies and may even be quite athletic”, “big and strong not as athletic as he needs to be, Snyder has room for improvement”, “her body, once the robust athletic image of health, now requires a machine to keep it alive”, and “they may be the stronger sex, powerful and athletic and all that, but men are as supple as steel girders” (Oxford Dictionary 1, 2018). While example sentences using the word *athlete* provided by Oxforddictionary.com include “he had the broad-shouldered build of a natural athlete”, “the aim is not to make the athletes comfortable but to make them champions”, “he holds the record for the most medals ever won by an athlete in a single Olympic Games”, “how are we ever go to produce top-class athletes if we leave it to children to take up sports themselves” (Oxford Dictionary 1, 2018). Each one of these sentences can be deconstructed and analysed in great detail about how our language defines these two words. The common theme that arises is that being *athletic* or an *athlete* is to be inherently masculine. The phrase “he had the broad-shouldered build of a natural athlete” indicates size and stature, and the phrase *build* implies that we can construct our bodies. The physical object with which we attribute our existence with is viewed as an object to be manipulated to complete a task. The English word for *machine* has two startlingly similar definitions: “an apparatus using mechanical power and having several parts, each with a definite function and together performing a particular task” and “a person who acts with the mechanical efficiency of a machine” (Oxford Dictionary 5, 2018). What can be concluded is that we see the *athletic body* as a machine to accomplish a task. Margaret Whitehead’s *embodiment* concept moves us away from

the construct of *ti*: the body as a machine to *shen*: the body as lived and removes the body/mind dualism construct of our language to allow us to understand ourselves as a whole body and mind as one (Whitehead, 2007).

Whitehead provides four definitions of physical literacy:

- A. Physical literacy can be described as the ability and motivation to capitalise on our motile potential to make a significant contribution to the quality of life. As humans we all exhibit this potential; however, its specific expression will be particular to the culture in which we live and the motile capacities with which we are endowed.
- B. An individual who is physically literate moves with poise, economy and confidence in a wide variety of physically challenging situations. Furthermore the individual is perceptive in ‘reading’ all aspects of the physical environment, anticipating movement needs or possibilities and responding appropriately to these, with intelligence and imagination.
- C. A physically literate individual has a well-established sense of self as embodied in the world. This, together with an articulate interaction with the environment, engenders positive self-esteem and self-confidence. Furthermore, sensitivity to and awareness of our embodied capacities leads to fluent self-expression through non-verbal communication, and to perceptive and empathetic interaction with others.
- D. In addition the individual has the ability to identify and articulate the essential qualities that influence the effectiveness of his/her own movement performance, and has an understanding of the principles of embodied health, with respect to

basic aspects such as exercise, sleep and nutrition. (Whitehead, 2007, pp. 287-288)

Whitehead provides these four in-depth definitions of her term physical literacy to encompass all domains of exercise and physical activity: motivation, movement and responses to our environment, competency in movement, and confidence in self which lead to enhanced interaction, and through the first three we will increase our effectiveness and improve our performance. It is important for coaches to teach athletes to understand how to make their body the healthiest through proper nutrition, sleep, recovery, and training; concepts covered throughout the definition. Skill acquisition and execution are covered within the definition which ultimately means that the term *physical literacy* can be used to replace *athlete*. If we take the phrase “he had the broad-shouldered build of a natural athlete”, switching the term *athlete* for *physically literate* the phrase becomes “he had the broad-shouldered build of a naturally physically literate person”, which changes the connotation of imagery in our minds on what skills this person holds. Athlete entails sport-specific skills, while physically literate entails embodiment, therefore ultimately changing the sentence’s meaning. We cannot simply replace one word, *athlete*, with another, *physical literacy*, because the words in English, like *body*, are representative of physical objects like a body of water, body of people etc.; therefore, our sentences require new structuring, meaning we have to reconstruct our language and social interaction of the sentence. The sentence “how are we ever going to produce top-class athletes if we leave it to children to take up sports themselves” becomes “how are we ever going to produce top-class physically literate children if they are left to take up sports themselves”, eliminating the masculine-dominated connotation of *athlete* and left is the question of ‘who will teach these children if not us?’

Moving to a world of physical literacy will implement cultural changes and may be a method of addressing a changing immigration population to Canada, female drop out from sport, and overall physical activity levels of Canadians through addressing perceived competency from teacher, coach, instructor or parent feedback. For those that struggle with FMS or athletic concepts, hearing the word *athlete* may impose preconceived notions of what is expected of them; moving to *physical literacy* when teaching FMS or early sport specific skills may move children away from comparisons with high profile sports players and allow them to intrinsically focus on their skill acquisition.

Part 3: The School, the Coach, and the Community

The BC k-9 Curriculum

In an interview with Nikita Pardiwala, a secondary high school teacher from Salt Spring Island, BC, she mentioned that there are “no specialist teachers in the elementary schools teaching physical education” on Salt Spring Island. And, when the students get to her high school physical education class, “they have no idea how to play basketball” (Pardiwala, 2018). Pardiwala uses the example of a popular sport that many people around the world play as a method of describing the lack of understanding FMS to play the game. FMS include locomotor, manipulative or object control, and stability (Lubans, Morgan, Cliff, Barnett, & Okely, 2010, p. 1020). Pardiwala stated that her high school physical education class was unable to play basketball because they had failed to learn these crucial FMS.

In the BC k-9 curriculum, the “Big Ideas” for teachers of grade 2 are to involve the children in daily participation in physical activity; learning how to participate and move in different physical

activities to develop physical literacy; adopt healthy personal practices and safety strategies to protect themselves and others; to have good communication and manage emotions; and that their physical, emotional, and mental health are all connected (British Columbia Ministry of Education, 2016). Although each grade has changing ‘Big Ideas’, the evolution of each concept does progress from kindergarten through grade 9. This paper is addressing the drop-out rate around the age of 12 to 14, indicating that children up to grade 8 or 9 are the primary concern. A full analysis of the BC Curriculum is beyond the scope of this paper, and therefore this will be a general overview of the approaches of the BC k-9 curriculum.

In the fifth grade, under current Curricular Competencies, students will be taught physical literacy, healthy and active living, social and community health, and mental well-being (ibid, 2016, p. 9). Though there is no specific definition of physical literacy contained in the curriculum, the general concept is understood that student participation in physical activity with an understanding of how to move. The content which grade 3 students are expected to know stems from physical literacy abilities outlined by Whitehead, which include accessing health information, bullying, substance use and personal harm, mental health, and self-identity (figure 10). Whitehead’s exploration of moving away from the mind/body dualism to embodiment is addressed within the curriculum where in grade 9 students are expected to know the “effects of different type of physical activity on the body”, “physical, emotional, and social aspects of psychoactive substances”, and “influences of physical, emotional, and social changes on identities and relationships” (British Columbia Ministry of Education, 2016, p. 17). Although a lot to tackle for education teachers who, in elementary school are not physical health educator specialists, Physical Health Education (PHE) classes are no longer focused solely on teaching sports.

When addressing physical literacy, the UBC Physical and Health Education website under class resources has a section on Physical Literacy (UBC Physical and Health Education, 2018). Using the CSFL physical literacy document, Figure 8 is displayed and physical literacy is defined as “individuals who are physically literate move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person” (ibid, 2018). This indicates that CSFL is involved with the Teaching Education program at UBC and teachers are being taught physical literacy concepts. For teachers being educated at UBC, Joyce Butler, a researcher in the Department of Curriculum and Pedagogy, is aware of the connections between language and how we teach physical education where her writing with Tammy Slater of Iowa State University wrote “little has addressed how sports education connects with literacy education” (Slater & Butler, 2015, p. 14).

However, when speaking with elementary school teachers, they describe a much more challenging approach to their classrooms. Anna Morris who teaches grade 5/6 in Vancouver, and Megan McMurray who teaches grade 3/4 in Pemberton, have both stated that they only get two classes of PHE a week (Morris, 2018) (McMurray, 2018). Morris stated that her PHE class early in the week is in the morning, but the class later in the week takes place in the afternoon, and she has a hard time getting kids to engage and the kids often just want to play dodgeball. This is an interesting concept, counter to McGinley’s ‘Hall of Shame’ theory; however, this may be due to traditional constructs of what a physical education class looks like for the children. McMurray stated that her school has a Physical Education Specialist at their school, and that they teach the children health concepts such as healthy eating; but she finds the mental and physical health a challenge as the majority of her students don’t have the energy levels to get through the mentally challenging classes at the end of the day when they haven’t moved since the early morning

(McMurray, 2018). To counter this, McMurray will take recess early, or have a ‘brain break’ and get the kids active in the classroom.

Although the BC Curriculum on elementary school teachers addresses the embodiment principal and physical literacy in the PHE classes, two classes a week is obviously challenging for teachers to address both physical and mental health. With providing such limited structural importance in the number of PHE classes a week, it is evident that the new BC curriculum has not changed their approach to understanding PHE as an important educational topic. The Cartesian dualist concept is therefore still heavily doctrinarian the school system where aspects of the body are seen as lesser to that of the mind. Over a long period of time, students may learn the physical literacy concepts, however, two classes a week does not fit the ParticipAction’s 24-hour guideline. With children having limited access to the education of physical activity, the responsibility then falls on the shoulders of community recreation and sports teams to address this. The curriculum can address this problem by making PHE a mandatory daily subject, or by increasing the amount of recess, lunch break, or afternoon physical activity breaks.

A Case-Study of Three Swimmers in Edmonton, Alberta

Previously, I was a swim coach, and in the pursuit of higher performance in a club with limited pool space, those that were culturally not accepting of a more performance-driven program were pushed out of the club. With the *right to sport* in Canada, a cultural shift was needed to make those that did not want to pursue performance to leave the club. This aligns with Crane & Temple (2015) in citing the structural constraints are not reasons for drop out as it was team dynamics that forced 15% of the club to leave the club. This section explores a swim club in

Edmonton, Alberta, that has created a program that is able to address both the high performance and non-performance aspects of sport.

The Long Term Athletic Development Model in swimming follows, by age, the stages of Active Start (0 to 7 years female and male), FUNdamentals (female: 6 to 8 years, male: 6 to 9 years), Learn to Train (female: 8 to 11, male: 9 to 12), Train to Train (female: 11 to 15, male: 12 to 16), Train to Compete (female: 15+, male: 16+), Train to Compete (female: 18+, male: 19+), and Active for Life (14+) (Swimming Canada, 2011). Noting the drastic difference in training styles in the FUNdamentals and Learn to Train stages in comparison to the Train to Train and above stages and comparing that with the Statistics Canada data showing a 29.8% in female and 12.7% in male decrease in exercise times in children aged 12 to 17, kids are dropping out of sport and exercise programs when they reach in the Train to Train phase of their development.

As previously stated, interpersonal and intrapersonal constraints are the leading cause of people to drop out of sport (Crane & Temple, 2015). Teachers, instructors, and coaches are ultimately responsible for teaching the FMS/KPF's to their student while also being responsible for ensuring that the children feel competent in those skills. Children that either join a sport late or miss early instruction are at a disadvantage in sport as the skill development is designed to be linear. In the sport of competitive swimming, the primary word in defining the sport is *competitive*, and drives the coaches to produce results. This is not to say that performance is wrong or bad; the argument is that performance driven coaches will focus on children who can learn and pick up the KPF quickly.

Swimming Canada published their National Development Program ID Team Times, many sports refer to "On Track" times, which refers to being on-track to compete at the international level and likely win a medal. The age for the beginning of the ID teams for females is 13, while for

males it is 14, and each age category has three tracks: 1, 2, and 3, with 1 being the highest level or fastest time (Swimming Canada, 2016). These times are in Long Course (LC) or a 50m pool and all times mentioned below are LC times. The governing body of swimming in British Columbia, SwimBC, has mandated that sanctioned timed competitions are eligible for all swimmers who attain a 200 Individual Medley (IM) time of 4:00.00 or faster, which is referred to as the LMR Time Standard (Richmond Rapids, 2016). 4:00.00 is a standard all people who learn to swim will be able to attain. The 200IM is an excellent indicator of a competitive swimmer's ability in the sport, as it includes all four strokes in the order of butterfly, backstroke, breaststroke, and freestyle in one-quarter increments at a young age. Combined with the stroke challenge, each athlete must demonstrate that they can legally do the strokes and turns according to the Fédération Internationale de Natation (FINA) the international governing body of the sport. The average time per 50m lap is 1:00.00, or a movement speed of 0.83m/s. In comparison, the 13-year-old female ID Team Track-3 time for 200IM is 2:27.18 or an average speed of 1.36m/s, while the 14-year-old male ID Team Track-3 time for 200IM is 2:14.96 or an average speed of 1.48m/s (figure 11) (Swimming Canada, 2016).

For a female swimmer to move from 4:00.00 down to 2:27.18 they need to become 163% faster, while males need to become 178% faster. Although there are no analyses examining the longitudinal average improvement of swimmers across ages, for a female swimmer to improve 163%, it would take six years to decrease from 4:00.00 to 2:25.70 at an improvement of 9.5% a year to reach the ID Team Track-3 time of 2:27.18. However, six years less of 13 is seven, and as this falls into the FUNdamentals stage, the starting age of competition is 8 or 9, girls will need to improve an average of 11.6% or 17.1%, respectively, on average a year. For this to occur, coaches will be on the lookout for *natural talent*, or young children who can learn the KPFs of

swimming faster than others. Using one of three females in Canada who has attained the 13-year-old Swimming Canada ID Team qualifying time in 2017 as an example, it can be argued that KPF/FMS become crucial in a competitive sport when comparing her with another girl in her team. All information below is collected from swimrankings.net and is accessible any individual in the world with internet access. In searching for Canadian girls who have attained the ID Team Time who swim with a club in Canada, Emma O’Croinin of the Edmonton Keyano Swim Club (EKSC) was identified and two other girls from her team will be used as a basis for this case study.

Emma O’Croinin, born in 2003, who in July 2017 was 13, swam 200IM LC in a time of 2:22.14 at the Canadian Junior Championships, and the first time she swam the event in May 2012 her time was 3:44.22 at the age of 8 (Swim Rankings 1, 2018). Using 4:00.00 as the baseline time for entry into competitive swimming, O’Croinin’s time of 3:44.22 is 7% faster than 4:00.00, indicating at O’Croinin was already behind the average 9.5% improvements needed each year from the age of 7. Looking at the graph of O’Croinin’s time improvement (figure 6), it can be observed that an exponential increase in speed occurred between June 2012 and July 2013 where she improved by 24% in the 2012 season at the age of eight, then maintained ~8% improvements annually from the age of nine through 13 to reach the Swimming Canada ID Team standard by the age of 13. Looking at O’Croinin’s rankings nationwide from her time of 2:22.14 at the age of 13, she was third in Canada for the 13-14 age groups, and first on her team and in Alberta for her age group (Swim Rankings 1, 2018). O’Croinin’s time in comparison to other females her age in the EKSC show that the next fastest thirteen times in descending order are: 2:35.59, 2:35.62, 2:35.73, 2:36.68, 2:37.89, 2:39.33, 2:40.68, 2:45.34, 2:51.98, 2:55.20, 2:55.26, 3:01.20, 4:49.46 (Swim Rankings 2, 2018).

The second swimmer with times mentioned above with a time of 2:35.59LC is Sophia Robertson, born 2003, who's first attempt at the 200IM in May 2011 was 4:50.84 (Swim Rankings 4, 2018). In her second race on June 2012 she achieved a time of 3:52.82, a dramatic increase from the 2011 indicating that 2011 was most likely her first competitive year in the club at the age of 8. Robertson's improvement ratings were 24.9% from 2011 to 2012, and each year after her improvements were 15.6%, 5.4%, 8.2%, 9.1%, and 4.0% (figure 7) (Swim Rankings 4, 2018). Robertson displays a drastic increase in improvement similar to O'Croinin, however, the difference of 15.6% and 24% from the first time both girls were under 4:00.00 displays that O'Croinin had a better understanding of the sport's KPFs at a younger age.

In contrast, Riley Waples, born 2002, has a 200IM LC time of 3:01.20, and has swam the event twice in the 50m pool, the first time she reached a time of 3:12.80 in 2013 or over a 3.8-year period increased by 6.4% (Swim Rankings 3, 2018). Looking deeper into Waples' times, she has no recorded times prior to 2013, indicating either non-competitive nature, or late to join the sport (Swim Rankings 3, 2018). The likelihood of being a non-competitive swimmer at EKSC and not learning the important FMS/KPF is unlikely; therefore it is most plausible that Riley Waples joined the club in 2013. With competitive swimming having competition as the foundation of the sport, the KPFs for swimming are targeted towards improving performance, and for three swimmers in the same club to each demonstrate drastically different improvements, human variation in learning is definitely a reality. However, in a performance-based sport, it is obvious that learning and being able to demonstrate these KPFs at a young age is a key determinant of performance. The argument can therefore be made that not learning the KPFs of a sport at an early age impedes the development of an athlete. Considering the number of years it took each athlete to get about the same time; O'Croinin 3:03.47, Robertson 2:56.50, and Waples 3:01.20,

O’Croinin took 2.2 years from her first 200IM to achieve that time, Robertson took 2.8 years, while it took Waples 3.8 years to achieve approximately the same time. O’Croinin’s performance at the age of 13 is dramatically influenced by her early training, and this presumption aligns with findings from Barnett et al. (2008) and Lubans et al. (2010) that early learning of FMS impacts later development.

Other considerations of the above example can also be made on how the club itself is structured. EKSC has 11 training groups, where children 8 and under begin in the Bronze group, then move into Silver (10 and under), Gold (12 and under), Youth Development (13 to 17), Junior Championship (11 to 14), National (15+), International, then University/Independent; the Bronze, Silver and Youth Development groups each offer a ‘multisport’ option, described as “one less practice to allow children the time to be enrolled in other recognized athletic activities... must be enrolled in another sport that qualifies for the fitness tax credit to select this program” (Edmonton Keyano Swim Club, 2016). The club structure of EKSC is similar to all clubs in Canada where swimmers are placed in groups based on age and skill level and therefore can be an example of how competitive swim clubs in Canada are structured.

O’Croinin would train either in the Junior Championship group or the National Group, and having swam in the club since the age of eight would have done the pathway from Bronze upwards. Robertson would have had a similar pathway to O’Croinin and would train in the Junior Championship group. Waples on the other hand, presumed to have joined in 2013, and having been born in 2002, would have started in Silver Multisport and moved into Youth Development. These multisport groups are targeted towards allowing youth to enjoy other activities outside of swimming, which would avoid sport specialization by aligning with the LTAD and allow the club itself to have a larger client base, which in turn increases business.

Although most swim clubs are non-profit across Canada, coaches and admin staff still require salaries while pool time costs add up. A larger club means coaches can have higher salaries. For young coaches just beginning a career in coaching, they require formal education, such as the NCCP levels, but also must produce results. Coaches therefore, if ambitious, will focus on their results, which may impact the overall skill acquisition for children who struggle to learn motor skills due to perceived competency influenced by coach language and comparisons with others in the group.

For a large club like EKCS, the non-competitive stream is designed so that swimmers can pursue a multi-sport direction and a potential late-joiner like Waples is able to gain access to the sport of swimming. Although her performance is not near that of O’Croinin or Robertson, she is still gaining the health benefits of training by learning to swim. Waples may have missed the KPFs at an early age, however, when taking into consideration the lack of physical education children receive in schools, this option opens the door for non-competitive children to become physically literate.

For drop-out rates in all sports, statistics show that most drop outs occur at the age of 13. EKSC, offers multisport options for children up to the age of 17 (Edmonton Keyano Swim Club, 2016); however, for a smaller team that has limited pool space, this may be more difficult and children looking for a multi-sport option will be pushed out to make way for the competitive athlete. The LTAD addresses this and provides guidance for swim clubs to generate a non-competitive stream to allow the option for Active for Life. As previously mentioned, Whitehead’s definition of Physical Literacy encompasses how to enhance our performance in sport, and for children looking to gain physical literacy, joining a sports team can be an option for this education.

This case study explores the relationship of FMS and performance indicating that those that begin learning swimming at an earlier age can improve at a quicker rate than those that join later. Although still a new topic of research, overtraining in children due to performance demands to reach target times at an early age in swimming may be an area for further research. For a smaller swim club with less pool space, access for children to a multisport option may not be feasible, especially in a less populated urban or rural area. For EKSC, having a young child like O’Croinin performing at such a high level may indicate that their club is capable of training their development levels in a successful way. If other clubs look to the success of EKSC, they may copy the structure and develop non-competitive pathways like the multisport pathway to fit more in line with the LTAD and be less pressuring on children to participate in performance-driven sport.

The apparent problem with the system is that sports teams and community recreation are expected to make up for a lack of physical education in the schools. Socio-economic status has a large impact on the ability for families to enroll their children in sports, especially with immigrants (Stanec, Bhalla, & Mandigo, 2016). Although structural constraints of programs are not mentioned as a primary reason for drop out from sport (Crane & Temple, 2015), it could be interpreted that those that drop out were more dissatisfied with their personal constraints within the program and did not attribute their personal constraints originating from the program itself but from the coach or team.

Physical Literacy in the Community

As previously mentioned, Margaret Whitehead uses the term *physical literacy* as a way to describe how people can become more physically active in life. The definitions presented allows coaches to swap out the word *athletic* and replace it with *physically literate* which eliminates the

masculine association within *athletic* and *athlete*. Moving away from the concept of *body* and thinking about *embodiment* disconnects the mind/body dualism by removing the mechanical component of the body and allowing us to view our body as part of us.

Recently, Canada Sport for Life (CSFL) has created a Physical Literacy movement targeted at teaching parents and children FMS (Canadian Sport for Life Physical Literacy, 2017). Physical literacy, as defined by CSFL is

the development of fundamental movement skills and fundamental sport skills that permit a child to move confidently and with control, in a wide range of physical activity, rhythmic (dance) and sport situations. Physical literacy also includes the ability to “read” what is going on around them in an activity setting and react appropriately to those events (Canadian Sport for Life Physical Literacy, 2017, p. 5).

This definition aligns closely with Whitehead’s and separates FMS from a Fundamental Sport Skill (FSS) where the FSS is defined as the movement that is sport specific; for example, throwing a ball becomes throwing a ball over home plate (in baseball) (ibid, 2017, p. 12). CSFL explains that without FMS, FSS become harder to learn and states that “if you can’t throw, you won’t take part in baseball, softball, bowling, soccer, goalball, football, rugby” (figure 8) (ibid, 2017, p. 13). This aligns with previously mentioned research and indicates that Canada’s approach to teaching children active living is taking on a research-based approach to increase exercise levels.

Stephen McGinley of UBC is currently working alongside CSFL in incorporating physical literacy into the education that teachers are receiving (McGinley, 2018). Meanwhile, CSFL is

bridging the gaps with communities, schools, and sports groups to teach teachers, coaches, and instructors through workshops how to instruct physical literacy (Hastie, 2018). One of these workshops, Movement Preparation, designed by Dr. Dean Kriellaars and CSFL staff, uses a Fédération Internationale de Football Association (FIFA) designed warm-up procedure to teach FMS to children aged 8+ in lower-extremity movement (Physical Literacy, 2018). The warmup is broken down into dynamics, accelerations, cutting, ladders, and core. Dynamics have key objectives of “motor competence in forward and backward movement, dynamic balance, spatial awareness, lower body strength and power, aerobic fitness” (ibid, 2017). The key objectives of Accelerations include the ability to “develop sprint performance by improving acceleration and top speed, running form, lower body power, ability to start from right or left side, the ability to start from an unstable position, short-term energy systems” (ibid, 2017). Cutting has key objectives of

develop motor competence when changing direction from right-to-left, left-to-right while moving forwards, diagonally, and backwards, create proficiency in cutting (changing direction) through repetition-based learning, with progression in speed and other parameter, reduce asymmetry in movement proficiency, increase performance level, lower injury risk (ibid, 2017).

Ladders have the key objective of developing “motor competence in footwork, dynamic balance, spatial awareness, movement sequences, lower body strength and power” (ibid, 2017). Lastly, Core has key objectives of developing “multi-planar stability (control movement in all direction), multi-segmental stability, perturbation management for expected and unexpected circumstance, distal segment load control (control limb motion), and inter segmental buffering (use interposed joints to buffer load)” (ibid, 2017). Upon examination of the funding sources of this program, we

find that “financial support was through the Public Health Agency of Canada as part of the FIA Women’s World Cup – Canada 2015 Legacy”, while the project partners were all of the provincial and territory soccer associations of Canada and the Coaching Association of Canada indicating that the primary goal of this program was soccer related.

Although the program itself is designed to be a warm-up for all sports and exercise programs, the limiting factors of the warmup include no sport specific skill targeting. For a swim club to incorporate this program, children would not be warming up their arms, and the skills learned would not directly transfer to the sport. Other limiting factors of the warm-up are that it immediately moves into quick movements with a focus on speed without a warm-up of the whole body, while also not addressing the aerobic energy systems. This program was designed by FIFA, a soccer organization, and transfers predominantly to team field score-orientated sports or racquet sports. Counter to the BC Curriculum, which includes target games, net/wall games, striking/fielding games, and territory games, this program targets only territory games (UBC Physical and Health Education, 2017). In an attempt to increase FMS and engagement of sport, CSFL is encouraging a program that is limiting in the scope of sports the program can actually target. With a target audience of 8 to 12, this program also has an early expectation of FMS and ultimately is teaching FSS related to field or court sports.

For teachers, coaches, and sport instructors, the teaching of Movement Preparation is expected to increase FMS to children eight and older and to reduce injuries and engage kids into the activity better (Canadian Sport for Life Physical Literacy, 2017). Although this program was designed by FIFA for lower extremity sports, there is no sport equipment used during the program; it takes 15 to 20 minutes to go through and can be done on any large flat surface where it is safe to run. By removing the sport or competitive component of teaching, the movements children are learning

in the Movement Preparation warm-up become associated not with a sport, but with movement itself. They are not learning *athletic* traits, they are learning *physical literacy* which ultimately transfers from one sport, although lower extremity, field, or court based, to another and specialization becomes generalization. For teachers, coaches, and instructors, designing a program where FMS are taught with transferability, not specialization, is paramount to increasing the rate of exercise among children in Canada. CSFL's physical literacy program has setbacks and limitations; however, it is an important first step towards a physically literate nation.

Conclusion

Exercise time has seen a decreasing trend over the past decade: by the age of 13, boys are 12.7% and girls are 29.8% less physically active than they were when they were under the age of 12 (Colley, et al., 2017). This trend is also seen in sport where only 5% of youth aged 12 to 17 are getting the recommended 60 minutes of exercise a day, compared with 14% of those aged 5 to 11 (ParticipAction, 2015). Important to note is that these data are generated from self-reporting parents, and these numbers may not be completely accurate due to participant error, while the data also exempted approximately 4% of Canada's population, including First Nations people living in Reservations. Research examined why children drop out of sport and physical activities and indicated that interpersonal and intrapersonal constraints are the major reason for dropout (Crane & Temple, 2015). Of the interpersonal, physical competency has been reported as the highest reason for dropout, indicating that children are not learning FMS appropriately to develop perceived competence (ibid, 2015). FMS have been reported to increase perceived competency and increase participation in physical activities and sport later in life, while also

reducing the risk of injury (Lubans, et al., 2010) (Physical Literacy, 2018) (Barnett, et al., 2008) (McKenzie, et al., 2013).

Research has shown that Canadian-born females participate in sport significantly less than males (Larouche, et al., 2016), while also showing that female immigrants are less likely to be involved in exercise and sport (The Canadian Magazine on Immigration, 2017) (Government of Canada, 2013). Understanding a culturally diverse nation is paramount to increase physical activity among immigrants, and cannot only come from a discourse built primarily by individuals of European descent. Masculine identity has been acknowledged as a potential barrier for sport participants to self-identify with the sport they are in, and those that are unable to identify as having masculine athletic skills are more likely to drop out of sport (Guillet, Sarrazain, Fontayne, & Brustad, 2006). Cultural differences have also been attributed to participation in exercise programs (Babakus & Thompson, 2012), indicating that a movement away from the masculine-dominated discourse of sport is needed while also addressing cultural differences.

Understanding of the language we use to describe sports may be a central indicator in our communication with children which may affect their perceived competency. A movement away from defining the human body as a physical machine to accomplish sport-related tasks, and towards an embodied experience of the mind and body as one, may provide a deeper understanding of our interaction with physical activity, exercise, and sport. The term *physical literacy* can be used to describe the traditional views of what it means to be athletic (Whitehead, 2007), and can help remove the masculine-dominated discourse of sport which may redefine how we interpret sport and exercise.

Current approaches to engaging youth and society into physical activity, exercise, and sport have been developed and are being implemented into the school curriculum (British Columbia

Ministry of Education, 2016) (Canadian Sport for Life Physical Literacy, 2017) (Physical Literacy, 2018). Elementary schools play a vital role in developing FMS; however, with limited access to PHE classes, children are required to search outside of school for their physical literacy (Morris, 2018) (McMurray, 2018), while secondary school teachers are finding way to fill in the gaps from missed early education (Pardiwala, 2018). Recreation and sport-team programs are providing access to children and youth outside of specialization allowing for a multi-sport participation at the childhood level, while at the same time allowing those interested in pursuing high performance an avenue of exploration (Edmonton Keyano Swim Club, 2016) (Richmond Rapids, 2016). However, the pursuit of performance may hinder a child's development while financial constraints can be challenging for both Canadian-born and immigrants to Canada (Stanec, Bhalla, & Mandigo, 2016).

Using embodiment within the concept of physical literacy, we can incorporate our entire existence as an experience of the body and stop viewing our body as a machine to accomplish a task. Programs being implemented should be culturally aware and ensure that they are inclusive of everyone living in Canada. To do this, demographics of the area the team is in should be addressed and programs should be inclusive too all communities. The 24-hour guidelines provided by ParticipAction therefore either requires rewording in order to be inclusive of more communities in Canada, or multiple guidelines need to be provided like with the Canada Food Guide providing a First Nations, Inuit and Métis guideline (Government of Canada, 2016). Providing education to immigrants on expectations and traditions in Canada could potentially help increase their physical activity and transitioning towards and understanding of Canadian cultural norms. Removing masculine connotations in the language of sport by moving away from the word *athlete* and towards *physically literate* will promote gender neutral tactics to increase

female sport participation. Teachers, coaches, and instructors therefore need to be educated in how to better interact with their participants in these regards.

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Appendix

Figure 1

Table 1

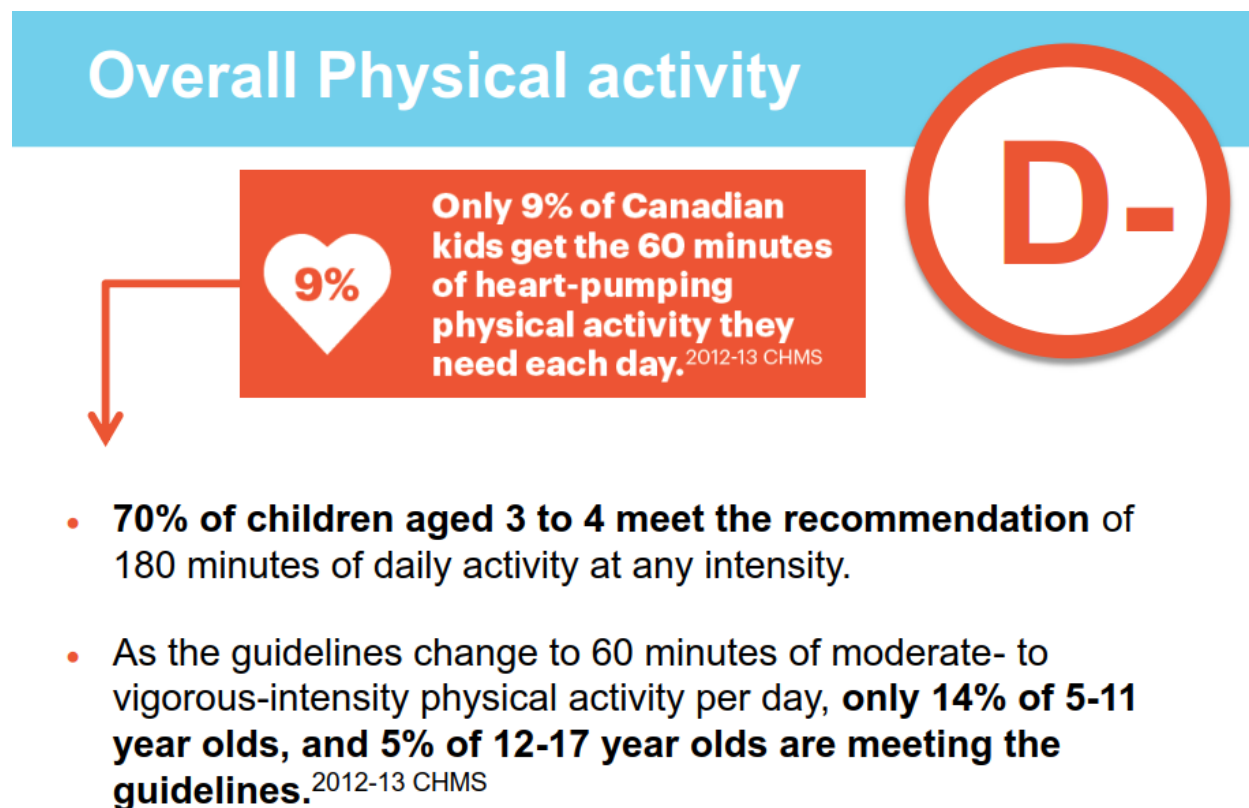
Average minutes per day of moderate-to-vigorous physical activity, by Canadian Health Measures Survey cycle, sex and age group, household population aged 6 to 17, Canada, 2007 to 2015

Sex and age group	2007 to 2009			2009 to 2011			2012 to 2013			2014 to 2015		
	Cycle 1 (n = 1,473)			Cycle 2 (n = 1,507)			Cycle 3 (n = 1,328)			Cycle 4 (n = 1,300)		
	Average minutes per day	95% confidence interval		Average minutes per day	95% confidence interval		Average minutes per day	95% confidence interval		Average minutes per day	95% confidence interval	
		from	to		from	to		from	to		from	to
Total	57	51	62	49	45	53	57	51	63	55	49	61
6 to 11	63	56	70	54	50	59	65	58	72	62	56	69
12 to 17	51	47	56	44	40	48	50	43	57	48	42	55
Boys	64	57	70	55	49	60	63	55	71	63	55	71
6 to 11	69	60	78	61	55	68	72	62	81	72	62	81
12 to 17	59	53	65	49	43	56	56	47	65	55	47	64
Girls	49	44	54	42	39	46	50	45	54	46	41	51
6 to 11	57	51	63	47	43	51	58	52	63	52	47	58
12 to 17	42	37	48	39	35	42	43	36	49	40	35	45

Source: 2007-to-2009, 2009-to-2011, 2012-to-2013 and 2014-to-2015 Canadian Health Measures Survey.

(Colley, et al., 2017, p. 10)

Figure 2



(ParticipAction, 2016, p. 15)

Figure 3

Chart 11 – Sport participation rates by mother tongue, 1992, 1998, 2005, and 2010

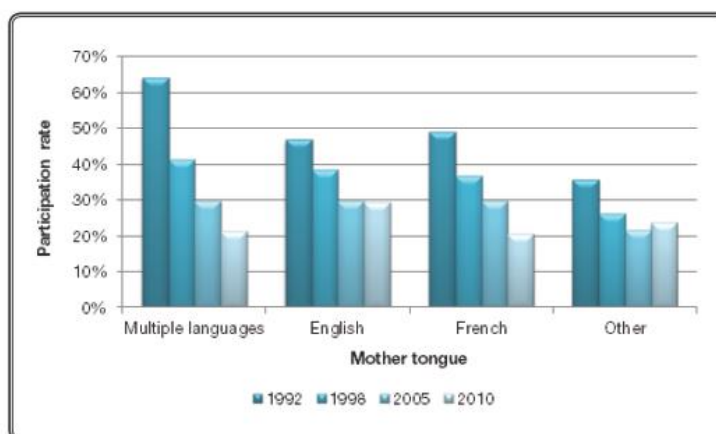


Table 6 – Profile of Canadians who regularly participated in sport, 2010

	Both sexes			Male			Female		
	Canadian population	Sport participants		Canadian population	Sport participants		Canadian population	Sport participants	
	Thousands	Thousands	Percentage	Thousands	Thousands	Percentage	Thousands	Thousands	Percentage
Total	28,075.6	7,230.1	25.8%	13,857.5	4,897.7	35.3%	14,218.1	2,332.4	16.4%
Age group									
15 to 19	2,290	1,247	54.4%	1,212	832	68.7%	1,077	414	38.5%
20 to 24	2,196	820	37.3%	1,078	605	56.1%	1,119	215	19.2%
25 to 34	4,721	1,364	28.9%	2,380	964	40.5%	2,341	400	17.1%
35 to 54	10,132	2,361	23.3%	5,073	1,615	31.8%	5,058	746	14.8%
55 and over	8,737	1,438	16.5%	4,114	881	21.4%	4,623	557	12.0%
Level of education									
Some secondary or less	4,587	1,263	27.5%	2,310	887	38.4%	2,276	376	16.5%
Some college/trade/ high school diploma	6,229	1,340	21.5%	2,940	882	30.0%	3,289	458	13.9%
Postsecondary diploma / some university	9,343	2,394	25.6%	4,739	1,676	35.4%	4,605	718	15.6%
University degree	7,271	2,214	30.4%	3,574	1,436	40.2%	3,697	778	21.1%
Don't know/not stated	646	F	F	294	F	F	352	F	F
Family income									
Less than \$20,000	1,433	106	7.4%	533	54	10.1%	900	52	5.8%
\$20,000 to \$29,999	1,359	207	15.2%	592	112	18.9%	768	95	12.4%
\$30,000 to \$49,999	3,461	659	19.1%	1,642	412	25.1%	1,819	248	13.6%
\$50,000 to \$79,999	5,050	1,242	24.6%	2,578	831	32.2%	2,472	412	16.7%
\$80,000 or more	10,304	3,408	33.1%	5,730	2,463	43.0%	4,574	945	20.7%
Don't know/not stated	6,469	1,608	24.9%	2,783	1,026	36.9%	3,687	582	15.8%

(Government of Canada, 2013, pp. 23, 28)

Figure 4

Chart 12 – Sport participation rate by year of immigration, 2010

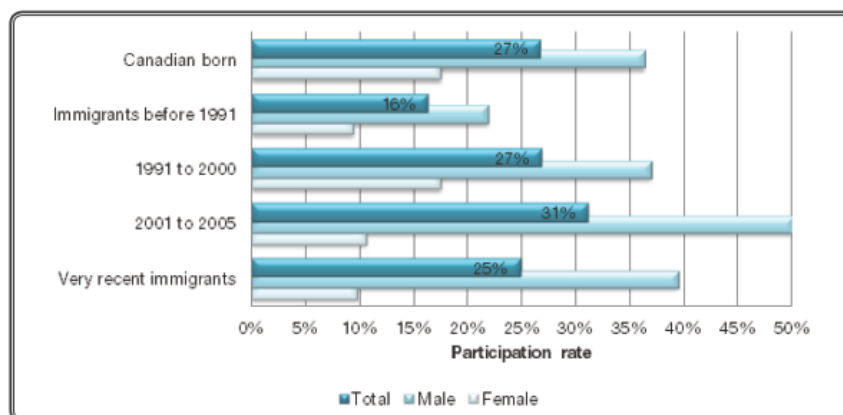
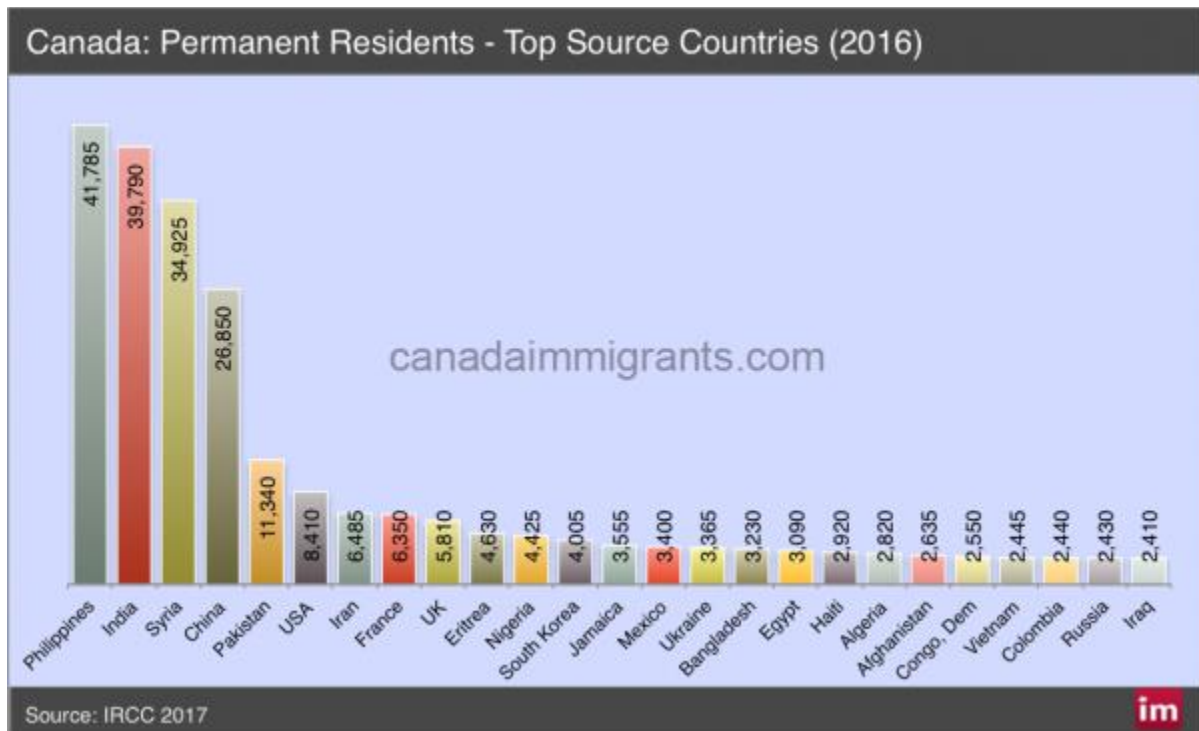


Table 5 – Adult Canadians regularly participating in sport by year of immigration, Canada, 2010

	Both sexes			Male			Female		
	Canadian population	Sport participants		Canadian population	Sport participants		Canadian population	Sport participants	
	Thousands	Thousands	Percentage	Thousands	Thousands	Percentage	Thousands	Thousands	Percentage
Total	28,076	7,230	25.8%	13,858	4,898	35.3%	14,218	2,332	16.4%
Recent immigrants (2004-2010)	630	175	27.7%	317	120	38.0%	313	54	17.4%
1990 to 2004	2,043	599	29.3%	985	437	44.4%	1,058	162	15.3%
Before 1990	2,973	482	16.2%	1,604	364	22.7%	1,369	119	8.7%
Canadian born	22,297	5,960	26.7%	10,891	3,962	36.4%	11,406	1,997	17.5%
Don't know/not stated	132 ^E	F	F	F	F	F	71.8 ^E	F	F
^E use with caution F too unreliable to be published Source: Statistics Canada, General Social Survey, 2010.									

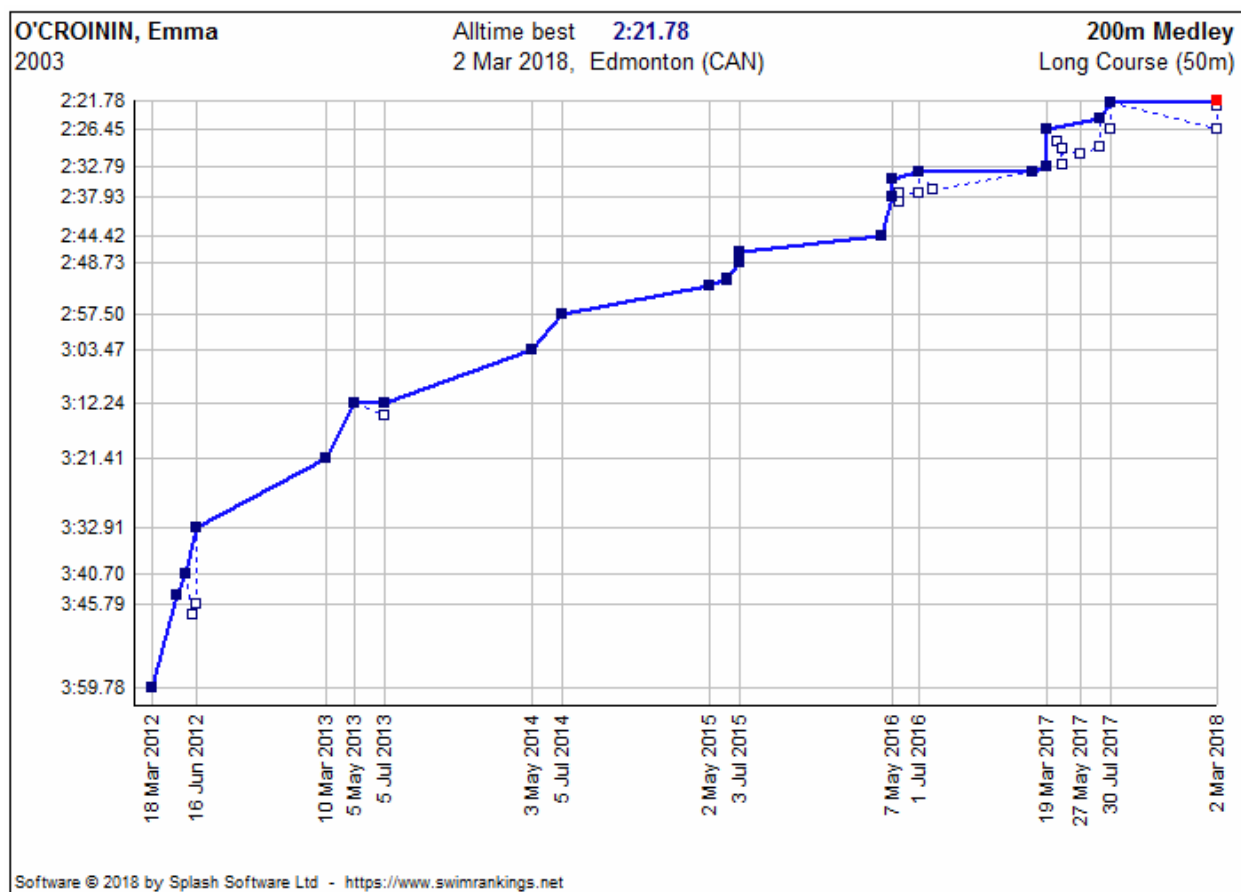
(Government of Canada, 2013, pp. 24, 28)

Figure 5



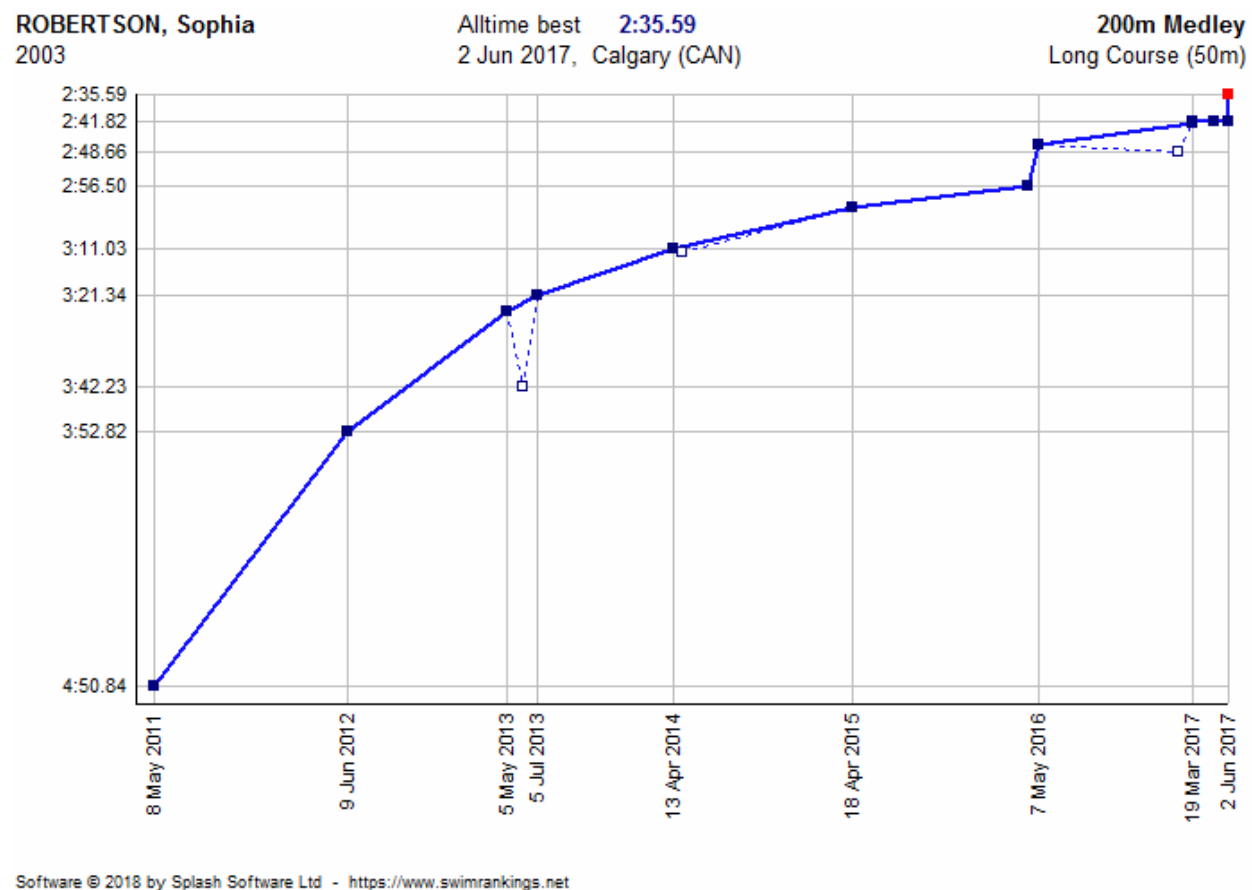
(The Canadian Magazine on Immigration, 2017)

Figure 6



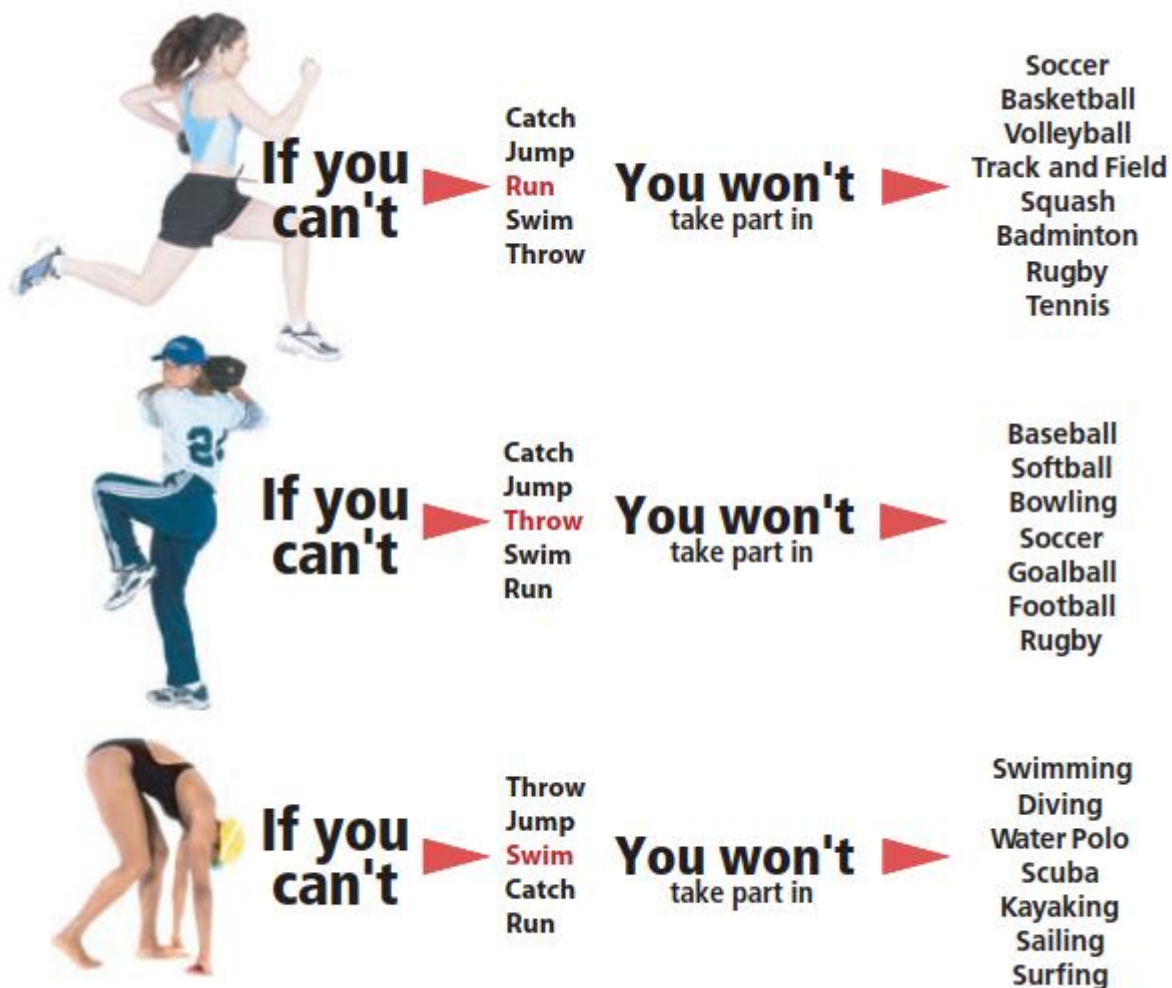
O'Croinin, Emma 200IMLC Improvement Graph (Swim Rankings 1, 2018)

Figure 7



Robertson, Sophia 200IMLC Improvement Graph (Swim Rankings 4, 2018)

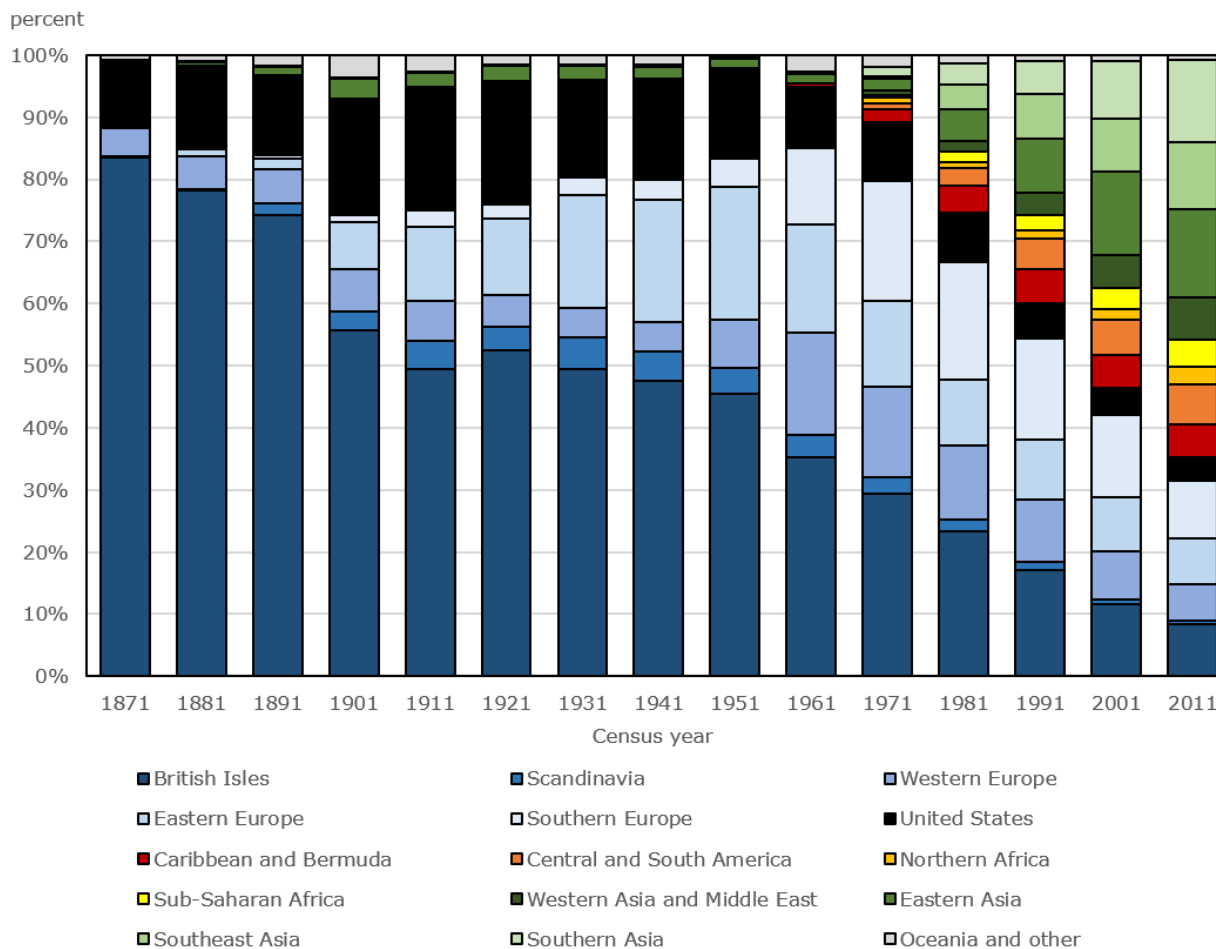
Figure 8



The Importance of FMS (Canadian Sport for Life Physical Literacy, 2017)

Figure 9


Chart 5
Distribution in percentage of the foreign-born population, by place of birth, Canada, 1871 to 2011



Sources: Statistics Canada, censuses of population, 1871 to 2001. National Household Survey, 2011.

Distribution in percentage of the foreign-born population, by place of birth, Canada, 1971 to 2011 (Statistics Canada, 2016)

Figure 10



BRITISH COLUMBIA
Ministry of Education

Area of Learning: PHYSICAL AND HEALTH EDUCATION

Grade 3

BIG IDEAS

Daily participation in physical activity at moderate to vigorous intensity levels benefits all aspects of our well-being.

Movement skills and strategies help us learn how to participate in different types of physical activity.

Adopting healthy personal practices and safety strategies protects ourselves and others.

Having good communication skills and managing our emotions enables us to develop and maintain healthy relationships.

Our physical, emotional, and mental health are interconnected.

Learning Standards

Curricular Competencies

Students are expected to be able to do the following:

Physical literacy

- Develop and apply a variety of fundamental movement skills in a variety of physical activities and environments
- Apply a variety of movement concepts and strategies in different physical activities
- Apply methods of monitoring exertion levels in physical activity
- Develop and demonstrate safety, fair play, and leadership in physical activities
- Identify and explain factors that contribute to positive experiences in different physical activities

Healthy and active living

- Participate daily in physical activity at moderate to vigorous intensity levels
- Identify and describe opportunities for and potential challenges to being physically active at school, at home, and in the community
- Explore and describe strategies for making healthy eating choices in a variety of settings
- Describe ways to access information on and support services for a variety of health topics
- Explore and describe strategies for pursuing personal healthy-living goals

Content

Students are expected to know the following:

- proper technique for fundamental movement skills, including **non-locomotor**, **locomotor**, and **manipulative** skills
- **movement concepts and strategies**
- ways to **monitor physical exertion levels**
- different types of physical activities, including **individual and dual activities**, **rhythmic activities**, and **games**
- practices that promote health and well-being, including those relating to **physical activity**, **sleep**, and **illness prevention**
- **nutrition and hydration** choices to support different activities and overall health
- **strategies for accessing health information**
- **strategies and skills to use in potentially hazardous, unsafe, or abusive situations**
- **nature and consequences of bullying**
- effects of different **substances**, and strategies for preventing personal harm
- relationship between worries and fears
- **factors that influence self-identity**

(British Columbia Ministry of Education, 2016, p. 5)

Figure 11



Swimming Canada
National Development Program ID Team Times

FEMALE

50 Free		100 Free		200 Free		400 Free		800 Free	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
13 27.94	27.71	27.65	58.97	58.62	58.17	4:27.16	4:29.21	9:07.44	9:13.91
14 27.15	27.31	27.46	58.85	58.51	58.15	4:22.28	4:24.30	8:56.53	9:04.83
15 26.79	26.96	27.10	57.87	57.53	57.11	4:18.07	4:20.05	8:47.39	8:55.55
16 26.46	26.63	26.77	57.02	56.69	56.27	4:14.50	4:16.45	8:39.95	8:48.00
100 Back		200 Back		100 Breast		200 Breast		400 IM	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
13 1:05.01	1:05.64	1:06.15	2:20.66	2:22.29	2:23.56	1:13.44	1:14.21	2:38.68	2:40.24
14 1:03.78	1:04.39	1:04.90	2:17.47	2:19.06	2:20.30	1:12.02	1:12.77	2:35.66	2:37.19
15 1:02.69	1:03.30	1:03.79	2:14.75	2:16.31	2:17.53	1:10.76	1:11.50	2:33.00	2:34.50
16 1:01.75	1:02.34	1:02.83	2:12.48	2:14.01	2:15.21	1:09.65	1:10.38	2:30.66	2:32.14
100 Fly		200 Fly		100 IM		200 IM		400 IM	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
13 1:04.44	1:04.96	1:05.36	2:21.10	2:22.38	2:23.31	2:24.98	2:26.23	5:03.02	5:06.32
14 1:03.11	1:03.62	1:04.01	2:17.85	2:19.10	2:20.01	2:22.10	2:23.33	4:56.92	5:00.16
15 1:01.94	1:02.44	1:02.82	2:15.08	2:16.30	2:17.19	2:19.61	2:20.81	4:51.67	4:54.84
16 1:00.93	1:01.42	1:01.80	2:12.76	2:13.97	2:14.84	2:17.49	2:18.68	4:47.21	4:50.33

MALE

50 Free		100 Free		200 Free		400 Free		1500 Free	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
14 25.31	25.49	25.64	55.13	55.57	55.90	4:11.74	4:14.14	16:47.60	16:57.79
15 24.73	24.91	25.05	53.83	54.26	54.58	4:05.92	4:08.26	16:21.96	16:31.89
16 24.21	24.39	24.53	52.68	53.10	53.42	4:00.92	4:03.22	16:00.08	16:09.79
17 23.76	23.93	24.06	51.68	52.10	52.40	3:56.71	3:58.97	15:41.73	15:51.26
100 Back		200 Back		100 Breast		200 Breast		400 IM	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
14 1:00.87	1:01.47	1:01.92	2:08.78	2:10.04	2:11.02	1:09.50	1:10.33	2:28.03	2:29.65
15 99.31	99.91	1:00.35	2:05.95	2:07.19	2:08.15	1:07.38	1:08.18	2:24.24	2:25.84
16 97.89	98.56	98.99	2:03.31	2:04.72	2:05.66	1:05.53	1:06.32	2:20.21	2:21.71
17 96.83	97.39	97.81	2:01.41	2:02.60	2:03.53	1:03.94	1:04.71	2:16.60	2:18.73
100 Fly		200 Fly		100 IM		200 IM		400 IM	
Track 1	Track 2	Track 3	Track 1	Track 2	Track 3	Track 1	Track 2	Track 1	Track 2
14 59.52	1:00.51	1:01.04	2:11.72	2:13.21	2:14.19	2:13.19	2:14.22	4:45.69	4:50.46
15 58.04	58.70	59.22	2:07.50	2:08.94	2:09.89	2:10.03	2:11.04	4:37.38	4:40.10
16 56.49	57.14	57.64	2:03.97	2:05.37	2:06.29	2:07.31	2:08.30	4:30.41	4:34.92
17 55.16	55.80	56.28	2:01.06	2:02.43	2:03.33	2:05.00	2:05.97	4:24.70	4:29.11

(Swimming Canada, 2016)