High school sport participation:

Does it have an impact on physical activity self-efficacy in adolescent males?

By

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Abstract

In this study, the association between physical activity participation and self-efficacy for physical activity was measured in adolescent males. Also, the possibility that self-efficacy levels differed between school sport participants and non-school sport participants was explored. The results of the Spearman's p test showed a moderate positive, and significant correlation between PAQ-A and SEPAQ scores, $r(113) = .571$, $p < .01$. The regression analysis showed that PAQ-A score significantly predicted SEPAQ scores, $b = 10.95$, $t(113) = 6.63$, $p < .001$. However, school sport participation did not significantly predict SEPAQ scores, $b = 0.99$, $t(113) = 0.97$, $p > .05$. Also, PAQ-A score and school sport participation explained a significant proportion of variance in SEPAQ scores, $R^2 = 0.33$, $F(2, 112) = 27.11$, $p < .001$. Implications for male participation in physical activity are discussed.

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Chapter 1: Introduction

Research has shown that a physically active lifestyle leads to good health, and that physically active people live longer and healthier lives (Erikssen, Liestol, & Bjornholt, 1998; Warburton, Nicol, & Bredin, 2006). Knowledge of the benefits of physical activity is readily available to the general public, and yet some people still do not lead a physically active life. Why might some people adopt a healthy, active lifestyle, while others do not?

There is considerable evidence that inactivity leads to a multitude of health problems, and is responsible for many premature deaths worldwide (Dwyer et al., 2008; World Health Organization, 2009). Despite the commonly known negative factors associated with inactivity, many people are still inactive, proven by the fact that 85% of Canadian adults currently do not meet the recommended amount of daily physical activity (Colley et al., 2011; Shields et al., 2010). Particularly, there is a large incidence of physical inactivity in youth throughout the world. (Pate et al., 2002; Colley et al., 2011). In Canada, 93% of children and youth are not meeting the recommended daily physical activity provided by governing bodies, like the Canadian Society of Exercise Physiology (CSEP), Public Health Agency of Canada (PHAC) and ParticipACTION (Colley et al.). These guidelines were put in place so that Canadians would become more aware of the amount of physical activity needed to remain healthy. The first set was only for adults, but more recently CSEP and Health Canada have provided guidelines for all age groups.

The first set of guidelines for children and youth was introduced in 2002 (Health Canada and CSEP, 2002a and 2002b). CSEP's current physical activity guidelines report

that children (aged 5-11 years) and youth (aged 12-17 years) require 60 minutes of moderate to vigorous physical activity each day (Health Canada and CSEP, 2011). Since the introduction of the Canadian physical activity guidelines, there have been subsequent attempts to improve physical activity level. At the Provincial level, the Manitoba government followed the initiatives of CSEP and PHAC. In 2008, after considering the statements of Manitobans, a government appointed group made several suggestions to the Manitoba government, some of which pertained to physical activity in children and youth. Specifically, these suggestions included that the provincial government should develop a physical education/health curriculum for Senior 1 through Senior 4 (Manitoba Curriculum Overview, 2012). The proponents of the effort to mandate physical education throughout high school understood that physical activity was paramount to healthy living. Currently, Manitoba students are remaining active through not only physical education, but also school sport.

The Manitoba High School Athletic Association (2012) reports that 192 high schools throughout the province compete in school sport. Within these schools, more than 37,000 athletes are competing in approximately 50 leagues. Although this figure may be inflated due to some students playing multiple sports, the numbers are still an important consideration. This research study will explore the possible differences between high school sport participators and non-participators specifically on self-efficacy for physical activity. School sport is a way for students to remain active and allows them to reap the positive effects of physical activity.

Remaining physically active can help combat certain diseases including: cardiovascular (PHAC, 2009; Statistics Canada, 2011a), diabetes (Warburton et al., 2006;

Gregg, Gerzoff, & Caspersen, 2003), and cancer (Canadian Cancer Statistics, 2012). Moreover, physical activity is associated with a myriad of psychosocial benefits including: depression, anxiety, social support, positive affect, vigour, self-esteem, and motivation (Calfas & Taylor, 1994; Dunn, Trivedi, & O'Neal, 2001; Kurc & Leatherdale 2009). One specific psychosocial variable that needs more research as it relates to physical activity is self-efficacy. Self-efficacy is the main component of Social Cognitive Theory, and is defined as the beliefs in one's capabilities to execute actions (Bandura, 1997).

This research will explore the possibility that there may be a discrepancy in physical activity self-efficacy between school sport participants and non-participants in high school males between the ages 14 and 17. This study will solely involve male participants. The current study is interested in the activity and self-efficacy level of males, particularly because males have sociological gender roles and are expected to behave according to those roles. These roles often include behaving consistently with the hegemonic masculine ideal, and this study is interested in how these ideals might affect physical activity, and self-efficacy in high school males (Guillet, Sarrazin, Fontaine, & Brustad, 2006). This research may be able to inform physical education and sport policy by providing information about how physical activity self-efficacy may affect current physical activity participation in youth depending on the context of their involvement (i.e., school sport participants or non school sport participants).

Chapter 2: Literature Review

Inactivity in Canada

The World Health Organization (WHO, 2009) recently estimated that inactivity is a risk factor for many chronic diseases, which results in approximately 1.9 million global deaths annually. The mortality rates caused by inactivity are exacerbated by the recent increase in overweight and obese people. Worldwide, 21,000 deaths are caused by physical inactivity every year (Dwyer et al., 2008). The WHO (2009) defines inactivity as a number of activities that share the same level of energy expenditure. More specifically, these behaviours can be done while the body is at rest. For example, watching television, using computers, and playing video games (i.e., "screen time") are common indicators of sedentary behaviours (Katzmarzyk et al., 2008). Resulting from this influx of screen time and other sedentary activities, the WHO reported that in 2005, 1.6 billion adults worldwide were overweight and approximately 400 million were obese. The global epidemic of inactivity has filtered into the Canadian population, where statistics show that Canada is at the forefront of many physical and psychosocial issues.

Prior to 2009, physical activity trends were self-reported through surveys. Statistics Canada's *Physical Activity During Leisure Time* (2011b) survey suggested that Canadian adults' physical activity level had been increasing in recent history. This survey reported that 53.8% of Canadian adults were at least moderately active during leisure time. At first glance, this might sound promising but, upon closer examination, almost half of Canadians were not active during leisure time. Also, the prevalence of overweight and obese Canadian adults has increased to 25% since 1986 (Colley et al., 2011). Statistics Canada (2011c) reported that only about 5% of Canadian adults accumulated

150 minutes of moderate-to-vigorous physical activity (30 minutes, five days per week). Similarly, it was reported that only 7% of Canadian children and youth participated in 60 minutes of moderate-vigorous physical activity per day, at least six days per week. CANPLAY's (2009) cross-sectional study found that 87% of youth were not taking the required number of steps per day to meet recommendations.

The apparent low levels of physical activity participation among Canadian adults, and the increasing number of overweight and obese Canadian adults inspired Colley et al. (2011) to perform a research study to objectively measure physical activity in Canadian adults. The Canadian Health Measures Survey (CHMS) used accelerometers to measure both active and sedentary behaviour of a representative sample of Canadians from the ages 6 to 79. Colley et al. found that on average, Canadian adults were sedentary for 9.5 waking hours each day. Moreover, children and youth were sedentary for 8.6 waking hours, which increased to an average of 9 hours between the ages 15 and 19. The research also reported that adolescents took fewer steps compared to children aged 6 to 10. The apparent sedentary lifestyle of average Canadians explained the increasing number of overweight and obese Canadians in the last 25 years, and according to Colley et al., the sedentary behaviour was more prevalent during adolescence. This is precisely why it is important to do more research on the factors that affect physical activity during adolescence. Resulting from the apparent problem of inactivity in Canada, certain governing bodies have retained the task of creating information aids to improve the awareness of this problem, and ways to become healthier.

Canadian Physical Activity Guidelines

In recent history, the issue of inactivity in Canada has become increasingly more apparent. This inspired organizations to construct information aids for Canadians, specifically referencing the need for increased physical activity. Since 1995, the Canadian Society for Exercise Physiology (CSEP), in union with the Public Health Agency of Canada (PHAC), developed a set of guidelines intended to help Canadians live a healthy, active life. In 1998, the first version was published for adults aged 20-55 years (Health Canada and the CSEP, 1998). Subsequent guidelines were developed for adults aged 55 and older (Health Canada and the Canadian Society for Exercise Physiology, 1999), for children aged 6-9, and for youth aged 10-14 (Health Canada and CSEP, 2002a). In 2011, CSEP developed a new set of physical activity guidelines that were endorsed by PHAC, and circulated by the organization ParticipACTION.

CSEP's (2011) current set of physical activity guidelines reports that children (aged 5-11 years) and youth (aged 12-17 years) require 60 minutes of moderate to vigorous physical activity each day, while adults (aged 18-64) and older adults (aged 65 plus) require at least 150 minutes of moderate to vigorous physical activity each week. Canadian youth were previously reported as a very sedentary age group (Colley et al., 2011), so it became important to elaborate on the guidelines for that age group. In addition to 60 minutes of physical activity each day, it is required that youth participate in vigorous-intensity activities, and muscle/bone strengthening activities at least 3 days per week. The Canadian physical activity guidelines are an example of efforts to combat inactivity at the national level, but steps have also been taken to encourage physical activity in youth and adults at the provincial level.

Physical Education in Manitoba

In 2004, Manitoba Premier Gary Doer announced the formation of an all-party task force called *Healthy Kids, Healthy Futures.* Its decree asked Manitobans for their opinion on health, and, subsequently, a report was produced that gave recommendations to help children and youth enjoy a healthy and long-lasting adult life. Specifically, the task force was interested in nutrition, physical activity, and injury prevention. In 2008, after considering the testimony of many Manitobans, the all-party task force made many suggestions to the Manitoba government. Among these recommendations, the following pertained to physical activity in children and youth. First, the provincial government mandated the amount of time that students in kindergarten to grade 8 should spend in physical education/health classes. Second, they mandated the current amount of time that Senior 1 and Senior 2 students should spend in physical education/health classes. Schools could choose to meet the mandated times within the timetable, or use an out-of-classroom model for up to 20 hours of the mandated 110 hours. Third, the provincial government developed a physical education/health curriculum for Senior 3 and Senior 4 students. Finally, all Senior 3 and Senior 4 students must complete two physical education/health credits for graduation, in addition to the two credits required in Senior 1 and Senior 2. According to the Manitoba Physical Education/Health Education Overview (2008), the aim of the curriculum is to "provide students with planned and balanced programming to develop the knowledge, skills, and attitudes for physically active and healthy lifestyles. The vision was physically active and healthy lifestyles for all students" (p. 1).

The Manitoban government recognized that there was a need to develop a particular set of guidelines that supported the Canadian physical activity guidelines. The all-party task force also recognized that children and youth spent a large proportion of

their time in school, and that physical activity during school time was important. CSEP, PHAC, and the Manitoban government showed that the mission to increase physical activity in Canada was a shared endeavor, and it was vital to ensuring healthy, and active Canadians for life. The Canadian Physical Activity Guidelines and the introduction of mandatory physical education from K-12 were initiated because of the inactivity epidemic that spread across Canada. Also, these organizations understood that increases in physical activity lead to a myriad of benefits.

Physical Benefits of Activity in Adults and Youth

CSEP's physical activity guidelines and Healthy Kids, Health Futures all-party task force were successful in formulating specific recommendations for children and youth to increase physical activity. What do adults, youth, and children gain from participating in the recommended amount of physical activity? There are plenty of benefits from participating in physical activity and these include physical, emotional, and psychological well-being. Researchers in recent years have highlighted the benefits of physical activity on disease prevention, namely cardiovascular disease (PHAC, 2009; Statistics Canada, 2011), diabetes (Warburton et al., 2006; Gregg, Gerzoff, & Caspersen, 2003), and cancer (Canadian Cancer Statistics, 2012).

Cardiovascular disease. The Heart and Stroke Foundation of Canada (HSFC, 2012) defines cardiovascular disease as injury to the heart, blood vessels of the heart (i.e., veins and arteries), and the system of blood vessels in the brain and throughout the body. For example, a stroke can occur when there is a lack of blood flow to the brain, and is considered a cardiovascular disease. Statistics Canada (2011) published a report based on data from 2008, which stated that heart disease and stroke are two of the three leading

causes of death in Canada. The same report stated that in 2008, cardiovascular disease caused more than 69,500 deaths. The Public Health Agency of Canada's *Tracking Heart Disease and Stroke in Canada (2009)* cited that in 2007, 1.3 million Canadians reported having a form of heart disease. The HSFC Annual Report (2010) stated that 50,000 strokes occur each year, and the startling fact is that 80% of these strokes are preventable (HSFC, 2010). Due to these current cases of CVD in Canada, there is a need for an increase in physical activity participation. Physical activity can prevent heart disease and stroke by lowering blood pressure and increasing HDL cholesterol (Thompson, Buchner, & Piña, 2003). Myers, Prakash, Froelicher, Partington, and Atwood (2002) found that participants who increased physical fitness by 1 metabolic equivalent (i.e., unit of energy expenditure), received a mortality benefit of 12%. In a Canadian study, Warburton et al. (2006) found similar results to Myers et al. (2002) when they found that a one metabolic increase in cardiorespiratory fitness was associated with a 20% mortality benefit. Warburton et al. also investigated many studies that stated being fit or active was associated with 50% greater risk reduction of cardiovascular disease. Research has also linked physical activity and cardiovascular benefits in children and youth. Strong et al. (2005) published a systematic evaluation of 850 articles regarding school-age children and the benefits of physical activity. They concluded that there was evidence that physical activity had favorable effects on adiposity (state of being fat), musculoskeletal health, and many factors involved in cardiovascular health. The review also concluded that physical activity had beneficial effects on blood pressure, and cardiovascular risk factors (i.e., inflammatory markers, endothelial function, and heart rate variability).

Diabetes. The Canadian Diabetes Association (2012) defines two types of diabetes. Type 1 diabetes, usually diagnosed in children and adolescents, occurs when the pancreas cannot produce insulin, and currently affects 10% of cases. 90% of cases are type 2 diabetes, which involves the body's inability to sufficiently use the insulin produced. A 2009 report from the National Diabetes Surveillance System stated that 6.6% or the Canadian population have been diagnosed with diabetes. Physical fitness is one of the strongest predictors of all cause mortality in people with diabetes (Church & Cheng, 2004), so it is important to show the association between them. Research has shown that both aerobic and resistance exercises have been associated with a reduced risk of type 2 diabetes. In a large predictive study, for every increase of 500kcal of energy expenditure per week, there was 6% decrease in incidence of type 2 diabetes (Warburton et al., 2006). The benefits of physical activity were particularly more evident in people with high risk for diabetes (i.e., people with above normal BMI ratings). These findings are corroborated by several other investigations on the subject (Laaksonen, Lindstrom, & Lakka, 2005; Tuomilehto, Lindstrom, & Eriksson, 2001). Physical activity has been shown to increase the chance to prevent diabetes, but there is also evidence that physical activity is effective as a treatment. One study found that walking at least 2 hours per week was linked with a reduction in the incidence of premature death of 34-53% from cardiovascular disease among patients with diabetes (Gregg et al., 2003). Lastly, Knowler and Barrett-Connor (2002) reported that physical activity could be as powerful as glucose medication, without the side effects. In youth, being physically fit can lead to better overall glucose control and reductions in serum lipids, which are two positive benefits regarding diabetes (Faulkner, 2010). This finding is consistent with previous reports on

benefits of physical activity in youth with diabetes (Heyman et al., 2007; Rachmiel, Buccino, & Daneman, 2007).

Cancer. The Steering Committee on Cancer Statistics, which consists of members from PHAC, Statistics Canada, the Canadian Council of Cancer Registries, US Centers for Disease Control and Prevention, as well as researchers in universities and cancer agencies released Canadian Cancer Statistics (2012), which reports that 186,400 new cases of cancer and 75,700 cancer deaths will occur by the end of 2012. It was also reported that in adolescents and young adults (i.e., 15-29), there was an average of 2,075 new cancer cases per year between 1992-2005, and 326 deaths per year between 1991-2004. There is an abundance of studies stating that regular physical activity, whether in the workplace or during leisure time, is linked with reductions in the incidence of colon and breast cancer (Warburton et al., 2006). Specifically, physically active men enjoy a 30-40% reduction in relative risk to colon, similarly physically active women have a 20-30% reduction in relative risk of breast cancer. These numbers are compared to inactive equivalents (Lee, 2003). It is clear through extensive research that physical activity is associated with many health benefits, including the reduced risks of chronic diseases like: cardiovascular disease, diabetes, and cancer. Physical activity is not only associated with physical benefits, but it is also linked to many psychosocial benefits (Calfas & Taylor, 1994; Dunn, Trivedi, & O'Neal, 2001; Kurc & Leatherdale 2009; Canadian Cancer Statistics, 2012).

Psychosocial Correlates of Activity

There has been research that highlights the relationship between physical activity and a variety of different psychosocial factors. Some of these factors include depression and anxiety, support and positive affect, vigour, self-esteem, and motivation.

Depression and anxiety. Multiple studies have reported that regular physical activity can improve mood states, while decreasing anxiety and depression (Ross & Hayes, 1988; Dunn, et al., 2001). Babyak et al. (2000) reported an improvement in participants diagnosed with major depression after an aerobic exercise intervention, which was comparable to the improvements of the participants who received psychotropic treatments. Furthermore, participants in the physical activity intervention group had significantly lower relapse rates than those in the psychotropic treatment group. In 2001, a review of nine cross-sectional studies and nine prospective studies investigated the link between physical activity, depression, and anxiety (Dunn et al., 2001). Both the cross sectional and the prospective studies showed an inverse relationship between physical activity and depression symptoms, meaning that as physical activity increased, there were reduced symptoms of depression. More recently, using data from the 2003 National Comorbidity Survey, one study found that regular physical activity was associated with decreased prevalence of depression, general anxiety, and anxiety disorders (Goodwin, 2003). Recently, Landers and Arent (2007) found that both aerobic (i.e., walking, biking) and anaerobic (i.e., resistance training) were linked to reductions in anxiety and depression scores.

Social support, and positive affect. There are external factors that affect physical activity, and these factors can come from a variety of sources. Specifically, Sallis, Prochaska, and Taylor (2000) cite that there is an association between social

support from family or friends, and physical activity in youth. This can be both direct (i.e., overt assistance) and indirect (i.e., emotional support and encouragement) social support (Beets, Vogel, Forlaw, Pitetti, & Cardinal, 2006). Prochaska, Rodgers, and Sallis (2002) continued their research with and supported previous findings that parent and peer support significantly correlated with physical activity, in adolescents. Coakley and White (1992) cited support from family and significant others, as a contributing factor to remaining physically active. This can be linked to team sports because the support from teammates might also contribute to sustained physical activity. This notion is supported in a research study, which found that teammate support plays an important role in adherence to rehabilitation, after injury (Bianco, 2001). Research also indicates that physical activity is linked with positive affect, especially when performed in a social context (McAuley, 1994). Gauvin and Rejeski (1993) observed similar results in that participants expressed a significantly higher positive affect in a group physical activity setting versus activities that were performed alone. Recently, Kurc and Leatherdale (2009) conducted a study involving 25,416 students in grades 9-12 in 76 Ontario secondary schools, which supports the previous findings. This study's objective was to examine how social support, participation in intramurals, varsity, and community sports were associated with physical activity. The results showed that students with low social support for physical activity were less likely to be active, and that participation in school and community-based sport increased the likelihood that students were active.

Vigour and self-esteem. An aspect of one's mood includes their mental energy level, or vigor. Vigour has been noted as an integral aspect of a positive well-being (Wilson & Cleary 1995). Research has shown that physical activity can increase the

feeling of revitalization (Gauvin & Rejeski, 1993) and acute exercise can significantly increase the feeling of perceived energy. A small number of studies have researched whether physical activity and self-esteem have a positive relationship. McAuley (1994) indicates that physical activity is related to positive self-esteem. The research also confirms that there is a relationship between physical activities another psychosocial variable similar to self-esteem, called self-efficacy (McAuley). A recent meta-analysis of 113 studies found that there are small, but significant improvements in global self-esteem as a result of physical activity (Spence, McGannon, & Poon, 2005). Moreover, a similar systematic review found that exercise could have short-term benefits on self-esteem in children and adolescents (Ekelund, Heian, & Hagen, 2005). The findings of Ekelund et al. were supported in a study of 3,796 Ontario students ranging from 11-20 years old (Faulkner, Adlaf, Irving, Allison, Dwyer, & Goodman, 2006). The researchers found that physical activity and self-esteem had a significant positive correlation.

Motivation as a predictor of physical activity. What drives people to stay active? Deci and Ryan's (1985) Self-Determination Theory explains that people have an innate need to be autonomous, socially related, and competent. This can explain how people motivate themselves to remain physically active. These needs help develop self-motivation, personality integration, and positive outcomes (Deci & Ryan, 2000). Quite simply, the theory states that when self-determined motivation exists, positive consequences happen. The first need that drives motivated behaviour is autonomy, or the urge to be and act according to the idea of oneself (Deci & Vansteenkiste, 2004). The second need is social relatedness, or the idea of being connected to others. The third need is competence, which is the most important aspect of the SDT as it pertains to this

research project. Deci and Ryan discussed that motivation stems from situations (i.e., rewards, positive feedback) that lead to feelings of competence (i.e., feeling in control of an outcome). The authors continue to explain that any increase in competence can lead to an increase in intrinsic motivation. Zhang, Solmon, Kosma, Carson, and Gu (2011) support this notion by reporting that intrinsic motivation in physical education positively predicted physical activity participation within school settings and beyond. Also, it has been found that children who receive low scores on perceived physical competence are consistently associated with reduced PA, and high scores are associated with more regularly frequent PA (Crocker, Eklund, & Kowalski, 2000; Norman, Schmid, Sallis, Calfas, & Patrick, 2005). Finding motivation to be physically active through situations that increase competence is closely linked to the psychosocial focus of this research study. This research will measure the not only the competence levels for physical activity, but also each participant's beliefs in their capability to perform physical activities in various situations (i.e., physical activity self-efficacy).

Overview of Social Cognitive and Self-Efficacy Theory

Albert Bandura's (1977) concept of self-efficacy was developed as part of a larger theory called the Social Cognitive Theory. Bandura formed this theory because he was dissatisfied with two major theories at the time, behaviourism and psychoanalysis. According to Bandura, in these two theories, the role of cognition in motivation and the role of environment are basically ignored. Social Cognitive Theory (1986) explained that individuals do not just respond to their environment, but they actively seek and interpret information (Nevid, 2009). More specifically, Bandura (1999) explained that "individuals function as contributors to their own motivation, behaviour, and development within a

network of reciprocally interacting influences" (p. 169). Bandura's Social Cognitive Theory (1986) emphasizes how behavioural, personal, and environmental factors interact to motivate behaviour (Crothers, Hughes, & Morine, 2008). The theory states that human functioning is the result of the interaction between these three factors, which is known as the Triadic Reciprocal Determinism model (Wood & Bandura, 1989). Wood and Bandura explained that these factors were not of equal strength, nor did they occur at the same time, but they combined to affect human behaviour. The Social Cognitive Theory is comprised or four processes of goal realization: self-observation, self-evaluation, self-reaction and self-efficacy.

Self-observation can be used to assess one's progress toward goal attainment, and it can motivate behavioural changes. Self-observation alone is insufficient because motivation depends on one's opportunities and efficacy (Zimmerman & Schunk, 2001). Next, self-evaluation compares an individual's current performance to a desired goal. People gain fulfillment when they achieve goals that they deem important. When individuals achieve valued goals, they are more likely to continue to exert a high level of effort since it provided satisfaction (Bandura, 1988). Self-reaction can also be motivating for behaviour change. If progress is made and considered acceptable, then individuals have a feeling of self-efficacy, and are motivated towards the achievement of their goal (Bandura, 1988). Once a person has achieved their goal, they re-evaluate and raise their standard, which could increase performance. Self-efficacy is the last component of goal realization, and is pertinent to the theoretical framework for the current study.

Self-efficacy is the main component of Bandura's Social Cognitive Theory, which proposes that human behaviours are learned through social interaction. Albert Bandura's

(1986) self-efficacy theory refers to the beliefs in one's capabilities to execute actions. Self-efficacy is not about one's skills; it is about a person's beliefs that he or she was able to produce a specific outcome. Bandura states that "people's level of motivation, affective states, and actions are based more on what they believe than what is objectively true. For this reason, how people behave can often be better predicted by the beliefs they hold about their capabilities, than what they are actually capable of accomplishing" (p. 2). In many situations, self-efficacy helps convert knowledge and skills into action (Bandura, 1986). Bandura also states that a resilient sense of self-efficacy allows individuals to competently use skills despite being faced with various personal, social, and situation barriers. Albert Bandura (1994) explained four sources that influence people's beliefs about their self-efficacy. The most effective way of strengthening self-efficacy beliefs is through mastery experience. The experience of success builds vigorous feelings of one's efficacy. The second way of strengthening self-efficacy is through vicarious experiences by others. Viewing people similar to oneself succeed increases that observer's beliefs that they also are capable to master those behaviours. The greater the assumed similarity between the observer and the model, the more persuasive the model's success or failures tend to be. Social persuasion is another way of strengthening self-efficacy. People who are told verbally that they are capable to master activities are more likely to perform with greater effort and feel more self-efficacy. Lastly, somatic, physiological, and emotional states could affect efficacy. When people experience stress, and tension, it is associated with vulnerability and may lead to poor performance. Physically, people view fatigue as a sign of physical debility, but people who associate these physical and emotional states with positive feelings, tend to feel more self-efficacy.

Bandura (1994) also referenced psychological processes through which self-efficacy can affect human behaviour. When people are faced with pressing situational stresses, it would take a strong sense of self-efficacy to remain focused on performance. According to Bandura, this can lead to erratic analytical thinking and lower ambitions, resulting in deterioration in performance. Conversely, if one maintains a resilient sense of self-efficacy, they set challenging goals and use productive analytical thinking, which results in performance achievements. Also, self-efficacy beliefs affect self-regulation of motivation. People motivate themselves by forming beliefs about what they can do, and anticipating the outcomes of an action. Those who have firm beliefs in their abilities would give more effort to master a challenge, which contributes to achievement. These beliefs of about ability have been found to predict behaviour in a variety of contexts. Research showed that both academic self-efficacy and academic self-concept were linked to desired student outcomes, including persistence (Lent, Brown, & Larkin, 1986; Skinner, Wellborn, & Connell, 1990), intrinsic motivation (Bandura, 1997; Skaalvik, 1997), the adoption of task and achievement goals (Bong, 2001); Skaalvik & Skaalvik, 2005), low anxiety levels (Skaalvik & Rankin, 1996; Zeidner & Schleyer, 1999) and academic achievement (Pintrich & Schunk, 1996; Marsh & Yeung, 1997). Research has shown that academic self-efficacy is linked to performance, but this study focused on self-efficacy in the physical activity and sport context.

Self-Efficacy, Physical Activity, and Sport

In the physical activity and sport setting, McAuley and Mihalko (1998) discussed that there is significant inconsistency across research in how self-efficacy is defined. Several researchers focused on general self-efficacy, where others focused on self-

efficacy for specific actions. This might be because self-efficacy is task and situation specific. For example, individuals might feel efficacious for riding a bicycle on the sidewalk at a moderate pace, but may feel very low self-efficacy for running 5 kilometers. Future research projects need to clearly distinguish what type of self-efficacy is being studied, and the respective context. There is a diverse collection of research regarding self-efficacy, physical activity and exercise, specifically linking self-efficacy to positive feeling states during exercise, increased exercise enjoyment. Research also states that these positive feelings can lead to an increase in exercise and physical activity adoption and adherence.

A number of studies have shown that self-efficacy can significantly predict the experience of positive feelings during exercise. McAuley and Courneya (1992) found that adults with high self-efficacy experienced more positive feelings during exercise than those with lower exercise self-efficacy. These results were supported by two studies, which found that efficacious female college students experienced more positive feelings during exercise than the less efficacious women (Bozoian, Rejeski, & McAuley, 1994; McAuley, Talbot, & Martinez, 1999). These studies are consistent with Bandura's (1986) statement that high self-efficacy for exercise results in more positive experiences.

Also, there is research that supports the notion that self-efficacy can predict exercise or physical activity involvement, and adherence. In a review of 300 studies regarding determinants of adult physical activity, Trost, Owen, Bauman, Sallis, and Brown (2002) found that self-efficacy was the most consistent link to active behaviour. The review's findings were consistent with a recent study of 161 college students (Von Ah, Ngamvitroj, Park, & Kang, 2004), which concluded self-efficacy was significantly

related to physical activity behaviour. More recently, Dishman, et al. (2005) posited that females with higher levels of exercise self-efficacy achieved greater levels of enjoyment. Dishman et al.'s findings were consistent with Bandura's theory—self-efficacy directly affected social-cognitive variables in exercise participation. As stated earlier, there is a multitude of research that links self-efficacy to physical activity and exercise in adults, but the research of adolescents is lacking, and more research is needed using students specifically in a school setting. In one particular study, Allison, Dwyer and Makin (1999) examined high school participants to measure the relationship between self-efficacy and exercise participation. The study design consisted of a survey of 1,041 grade 9 and grade 11 students. Their analysis indicated that self-efficacy was a predictor of exercise in high school students. The researchers found that self-efficacy to participate despite external barriers was significantly and positively correlated with exercise, most strongly in other school and outside of school settings. However, Allison et al. did not find significant results of exercise and physical activity in the school setting when conducting their research.

Bandura's (1997) theory describes sources of information that influence self-efficacy, and these sources might be more readily available to sport participants. It is important to research the potential differences in self-efficacy between school sport participants and non-participants on the basis that they might have different exposure to these sources of self-efficacy information. Research has shown a relationship between self-efficacy and physical activity participation, so a study relating to this topic can build on previous research. Moreover, it is important to explore the differences between school sport participants and non-school sport participants because there are many youth who

participate in sport in school, and the distinction between the two groups might affect their self-efficacy for physical activity.

Schools are an important context to study physical activity and self-efficacy. Some students engage in PA through school sport (i.e., sport-participants) while others choose not to be involved in school sport (i.e., non-participants). Due to the school curriculum, it is expected that all students will report physical activity participation but it is crucial to consider activities not linked to the fulfillment of this requirement. The aim of the Manitoba Physical Education/Health Education Overview (2008) is to "provide students with planned and balanced programming to develop the knowledge, skills, and attitudes for physically active and healthy lifestyles. The vision was physically active and healthy lifestyles for all students" (p.1). It is paramount to consider whether students can receive the knowledge, skills, and attitudes to lead a healthy life from activities such as school sport, which can add to the same benefits of physical education.

Rationale

Although there is research which links exercise participation and exercise self-efficacy, there is a need for more information regarding the link between self-efficacy and physical activity, specifically in adolescent males within the school setting. The Manitoba Youth Health Survey Report (2009) stated that only 55% of male students participated in the recommended amount of physical activity. Thus, it is important to gather information regarding factors that lead to physically active lives in male adolescents. Furthermore, research with adolescents is important because physical activity patterns established in adolescence can determine one's activity level throughout adulthood (Calfas, Sallis, Lovato, & Campbell, 1994; Sparling & Snow, 2002).

There are also important sociological reasons to study physical activity behaviours in adolescents, and specifically adolescent males. First, this research is using solely male participants because there might be sociological forces affecting their participation in physical activity and sport. Research has shown that girls feel less competent and attach less value to sport than boys, and that these differences in perceptions result in differences in participation in favor of boys (Fredricks & Eccles, 2005; Slater & Tiggemann, 2011). Studies confirmed that these sex differences might be caused by internalization of gender roles (Guillet, Sarrazin, Fontaine, & Brustad, 2006). Second, the social influence of parents can also act as a mechanism through which gender roles might affect sex differences (Bois, Sarrazin, Brustad, Touilloud, & Cury, 2002; Fredricks & Eccles, 2005). Moreover, parents appeared to encourage boys more than girls, regarding sports (Fredricks & Eccles, 2005). There was also a research about the pressures that males feel in regards to their bodies, and the hegemonic beliefs about masculinity. These beliefs might have affected how they view physical activity. Specifically, Norman (2011) referred to the double-bind (Bordo, 1999), in which men worried about achieving nice bodies but at the same time, society expected them to exercise a distant and disinterested relationship to their bodies. Recent research has shown that sport and exercise (Monaghan, 2007; Robertson, 2006) were ways for men to keep their bodies in shape, and consistent with society's recognizable masculine figure. More research needed regarding how the double bind dilemma affects sport and exercise participation in adolescent males. The fact that men faced this double bind means that there might be a variety of different reasons to participate in physical activity. Crawshaw (2007) suggested that men's health magazines continue to glamourize the aesthetically

healthy man. Magazines characterize healthy as lean, muscular and toned, and men might be enticed to participate in physical activity to ensure that their bodies consistently match these hegemonic ideals. This transmission of stereotypes about masculinity and the viewpoints about gender roles might influence boys to behave in certain ways regarding sport and physical activity. Thus, research is needed to explore how these sociological variables might affect physical activity participation and self-efficacy in adolescent males. Furthermore, these sociological factors might also affect whether adolescent males participate in school sport.

Bandura's theory (1997) can explain the need to study differences in self-efficacy between sport participants and non-sport participants. Self-efficacy develops from four main information sources: mastery experience, vicarious experience/modeling, verbal persuasion, and physiological state. Sport participants have many opportunities for mastery experience in physical activity through sport. For my project, physical activity will include any bodily movement produced by the skeletal muscles that requires energy expenditure. It will include all physical performances (i.e., games, and practices). Through sport, athletes might have more opportunity to experience successful acts in physical activity because it is part of the nature of sport. Assuming that non-participants do not have opportunity for master experience would be irrational, but sport-participants have the environment for mastery experiences every time they participate in team practices and games. Team practices are structured, organized and deliberate, so there may be a greater opportunity for increased self-efficacy in these sessions than in the various unstructured environments non-participants are privy to within the school setting. The non-participants do not have as many opportunities for structured sessions because

they do not participate in sports, so they must find other ways to experience mastery success in physical activity. Furthermore, athletes and non-athletes both have the opportunity to fail in certain mastery attempts, which is something that will be taken into account during this project. Nonetheless, research on the difference in self-efficacy levels between athletes and non-athletes is warranted because of the difference for potential opportunity for mastery experience.

Regarding exercise, athletes often participate in physical activity with their teammates at team workouts and practice. Thus, vicarious learning is ultimately going to be available to sport-participants. As they train with each other, their self-efficacy levels might increase from watching teammates perform physical acts successfully. For self-efficacy levels to increase in non-participants, those people would have to find others to gain this information from, thus the information from vicarious learning might not be as accessible to non-participants.

Sport participants have coaches and trainers who constantly encourage them to push their limits and reach their potential. Social persuasion in sport settings is readily available, as coaches and trainers are there to persuade participants to constantly strive to get better and try new things. Non-participants might not have the same social persuasion from coaches or trainers, so if they want that boost in self-efficacy information they must pay for it by hiring personal training or finding friends to supplement the persuasion. It is definitely possible for non-participants to do hire trainers but social persuasion is more readily available from team coaches and trainers than it is to non-participants, who must find persuasion elsewhere. These three sources of self-efficacy information are readily available to people who play both team and individual sports.

A case can be made for a difference in the availability of these information sources between participants and non-participants, thus warranting a research study to investigate the difference in self-efficacy level between the two groups. Although Bandura's theory indicates that there is a reason compare sport participants and non-sport participants regarding self-efficacy level, it is also important to show a documented relationship between self-efficacy and exercise participation.

Purpose

The current research aimed to build upon the past studies regarding the relationship between physical activity self-efficacy and physical activity participation. Also, this research explored the possibility that there may be a discrepancy in physical activity self-efficacy between school sport participants and non-participants. This study aimed to provide information for two research questions, including:

1. Does the continuous variable 'amount of time spent participating in physical activity' predict performance on a physical activity self-efficacy scale?
2. Does participation in organized school sport predict self-efficacy for physical activity in high school males?

Hypotheses

There are two hypotheses for this study, which are:

1. The a higher amount of the continuous variable 'amount of time spent participating in physical activity' will predict a higher score on a physical activity self-efficacy scale than a low amount of the continuous variable.
2. Sport will have an effect on the predictability for self-efficacy for physical activity in high school males.

Chapter 3: Methods

Participants

This study employed male participants, ranging from age 14 to 16. The participants were identified and separated into two groups. The first group consisted of students who did not play an organized school sport, while the second group contained students who played at least one organized school sport. This study employed male students within an urban Winnipeg high school. The participants from the sport-participant group chosen for the study included players from only team school sports because this research is specifically rationalizing that vicarious learning can be a source of self-efficacy in school sport participants, but not necessarily non-school sport participants. Those involved in school team sports might garner a better chance for vicarious learning.

Instruments

Each participant completed the Physical Activity Questionnaire for Adolescents (PAQ-A; Kowalski, Crocker, & Kowalski, 1997), which consists of questions pertaining to the amount of time spent engaging in various levels of physical activity per week (see Appendix A). Participants stated the amount of time they spent being physically active including aerobic activity, strength and resistance activities, and other general leisure activities. The results of the PAQ-A provided a quantified score for physical activity level.

This project also used the Self-Efficacy for Daily Physical Activity Questionnaire (SEPAQ; Campbell, 2012). The purpose of this scale was to measure participant's confidence in their ability to persist in regular physical activity (see Appendix B). A 100-

point response scale, which was divided into 10 unit increments, ranged from "0" (not at all confident) to "100" (completely confident) (Campbell, 2012). The results of the SEPAQ provided a numerical value, which quantified the exercise self-efficacy level for each participant.

Both questionnaires were in one package, with a cover sheet asking:

1. Do you participate in high school sport?

2. If yes, list the sports you have been involved in the past year.

Procedure

Upon approval from the Ethics Review Board or the University of Manitoba, a recruitment letter was sent to the school principle. The letter was composed to confirm that the faculty and students understood the purpose of this study. The school that provided participants was the researcher's alma mater. The researcher had a unique attachment to this data, as he is a graduate and current coach at the school. The sample was very accessible and the recruitment process was relatively smooth and supported. During the recruiting process, the terms and criteria for each group's participants, including what criteria each participant must meet was communicated. The potential participants were briefed on the purpose of the study and what was involved if a student chose to participate. Participation in the study was voluntary and consent from a parent/guardian was obtained before any data was collected (see appendix C and D). Upon return of both the consent and assent forms, the participants were asked to fill out the PAQ-A and the SEPAQ.

Design and Statistical Analyses

The simple linear regression model assumes that the mean of the dependent variable depends on the independent variable (Moore, McCabe, & Craig, 2012). In this research study, there were two independent variables, which is why a multiple regression analysis was used. Using the scores from both questionnaires, a multiple regression analysis was used to measure the relationship and predictability between the dependent variable (self-efficacy scale score) and multiple independent variables. The main independent variable was each participant's PAQ-A score. This project also used a discrete variable, specifically school sport participation. Although the PAQ-A score was an appropriate main IV for a multiple regression because it is a continuous variable (i.e., it can take on any value), this study also explored the possibility that sport participation added to the relationship and/or predictability of scores in self-efficacy for physical activity. Since school sport participation is a categorical variable, it was converted to an indicator variable ("dummy variable") of 0 or 1 to indicate the absence or presence of a categorical effect on the outcome. Simply, if a participant was not a school sport participant, they were given an indicator code 0, and if the participant played at least one organized school sport, they will be given an indicator code 1. This indicator code system allowed the categorical variable to be included in the regression analysis and enabled that variable to show an effect or no effect on the relationship and/or predictability between the main IV and DV. The results of the multiple regression will indicate if there is a predictable relationship between the amount of time one participates in strength or conditioning training, and score on the PASE scale.

Chapter 4: Results

Descriptive Statistics

The average age of the sample was 14.44 years (*SD*=0.73). The average score on the PAQ-A was 2.84 (*SD*=0.62), while the average score on the SEPAQ was 87.54 (*SD*=12.52). See Table 1 for descriptive statistics. See table 1.

Correlation

A pairwise and non-parametric correlation analysis showed a relationship between physical activity level and self-efficacy for physical activity. Specifically, PAQ-A scores showed a moderate positive pairwise correlation with SEPAQ score, $r(113) = .566$, $p < .01$. Also, since the SEPAQ scores were not normally distributed, the researcher used Spearman's p correlation. The results of the Spearman's p test also showed a moderate positive, and significant correlation between PAQ-A and SEPAQ scores, $r(113) = .571$, $p < .01$.

Multiple Regression Analysis

A hierarchal multiple regression analysis (Table 2) was performed on the PAQ-A and the SEPAQ to predict the overall SEPAQ score from PAQ-A score and school sport participation. The predictors were the scores on the PAQ-A questionnaire and the participation in an organized school sport, while the criterion variable was overall score on the SEPAQ questionnaire. The regression analysis showed that PAQ-A score significantly predicted an increase in SEPAQ scores, $b = 10.95$, $t(113) = 6.63$, $p < .001$. However, school sport participation did not significantly predict SEPAQ scores, $b = 1.975$, $t(113) = 0.97$, $p > .05$. Also, PAQ-A score significantly explained a proportion of

variance in SEPAQ scores, when excluding sport participation, $R^2 = 0.33$, $F(2, 112) = 53.32$, $p < .001$.

Table 1

Participant Descriptive Data for Hierarchical Regression

	Mean (*SD*)
Age	14.44 (*0.73)*
PAQ-A Score	2.84 (*0.62)*
SEPAQ Score	87.54 (*12.52)*

n = 115

Table 2

Summary of Hierarchical Regression Analysis for Variables Predicting Physical Activity Self-Efficacy

	Model 1		Model 2	
Variable	ΔR^2	β	ΔR^2	β
Physical Activity Participation	.321*	.566*	.321*	.541*
School Sport Participation			.006	.079
Total R^2			.327	

*$p < .05$

Chapter 5: Discussion

The main purpose of the current study was to determine if there was a relationship between physical activity participation and physical activity self-efficacy. More specifically, this study explored two possibilities. First, using a sample of high school males, this research investigated whether or not physical activity participation could predict physical activity self-efficacy. Second, the study examined the possibility that high school sport participation might add to physical activity's predictability of self-efficacy. This study's aim was to provide information for two research questions. First, does the continuous variable 'amount of time spent participating in physical activity' predict the performance on a physical activity self-efficacy scale? Second, does participation in organized school sport predict self-efficacy for physical activity in high school males? There were two hypotheses that stemmed from the research questions. The first hypothesis proposed that higher amount of the continuous variable 'amount of time spent participating in physical activity' would predict a higher score on a physical activity self-efficacy scale than a low amount of the continuous variable. The second hypothesis proposed that sport would have an effect on the predictability for self-efficacy for physical activity in high school males.

In this study, it was found that physical activity significantly predicted variability in physical activity self-efficacy among high school males. The correlation analysis results showed that performance on the Physical Activity Questionnaire-Adolescent (PAQ-A) was positively related to performance on the Self-Efficacy for Physical Activity Questionnaire (SEPAQ). The fact that there was a positive relationship between the two variables suggested that one's self-efficacy for activity was related to his ability to

participate in physical activity. This finding was consistent with the results of previous research, which stated that self-efficacy was significantly related to physical activity behaviour (Von Ah, Ngamvitroj, Park, & Kang, 2004), specifically in high school aged participants (Allison, Dwyer, & Makin, 1999). The results of the correlation analysis were consistent with Bandura's Social Cognitive Theory. Specifically, the results provided evidence that the sources of self-efficacy (i.e., mastery experience, verbal persuasion, and vicarious learning) can affect someone's physical activity participation. The positive relationship between the two variables suggested that the self-efficacy information sources for physical activity (i.e., mastery experiences, vicarious learning) encourage participation in physical activity in this sample of adolescent males. Lastly, the correlation results supported the first hypothesis that there is a relationship between physical activity and self-efficacy for physical activity. After the correlational analyses, multiple regression analyses were executed.

The multiple regressions analysis results showed that PAQ-A score predicted variability in SEPAQ score. Regarding the individual predictors, the results showed that a one-unit increase in PAQ-A performance significantly predicted a 10.95 unit increase in SEPAQ performance. This result showed that a small increase in physical activity can not only have a positive influence on physical health (PHAC, 2009; Statistics Canada, 2011; Warburton et al., 2006; Gregg, Gerzoff, & Caspersen, 2003; Canadian Cancer Statistics, 2012), but it also confirmed previous research that physical activity positively affected psychological health through an increase in self-efficacy (Von Ah, Ngamvitroj, Park, & Kang, 2004; Allison, Dwyer, & Makin, 1999). These findings supported the importance of the Canadian Physical Activity Guidelines. CSEP's (2011) current set of physical

activity guidelines reported that children (aged 5-11 years) and youth (aged 12-17 years) required 60 minutes of moderate to vigorous physical activity each day, while adults (aged 18-64) and older adults (aged 65 plus) required at least 150 minutes of moderate to vigorous physical activity each week. The results of this study strengthened the importance of these guidelines, regarding improving physical and psychological well-being through physical activity. The physical activity guidelines emphasize the fact that short bouts of physical (i.e., Ten minutes) can have physical benefits, but these results also highlight that short bouts of physical activity can have psychological benefits too.

Also, the R-square value showed that 32 percent of the variation in SEPAQ score could be explained by variability in a person's PAQ-A score. More simply, this suggested that physical activity level contributed to predicting how confident a person feels about their ability to be physically active. This supported the first hypothesis that a higher amount of physical activity will predict a higher amount of self-efficacy for physical activity. Also, these findings supported previous research, which stated that self-efficacy was a consistent link to active behaviour (Trost, Owen, Bauman, Sallis, & Brown, 2002). Again, these results support the Bandura's rationale that self-efficacy information sources can affect behaviour. The participants with high self-efficacy might be privy to more of these information sources regarding physical activity, and thus engage in more active behaviour. The relationship between physical activity and self-efficacy is consistent with recent research. Specifically, a recent review on physical activity correlates in adolescents found that self-efficacy was significantly and positively related to physical activity in 28 studies (Van Der Horst, Paw, Twisk, & Van Mechelen, 2007). Even more recently, Dwyer et al. (2012) found evidence in a sample of Canadian high school

students to support the findings of this review.

The regression showed that SEPAQ score could predict some variability in PAQ-A scores, however high school sport participation did not significantly predict active behaviour or self-efficacy in this sample. There was no significant evidence supporting the notion that school-sport performance affected SEPAQ performance. There is no sufficient evidence to support the second hypothesis that school sport performance added predictability to the model. The rationale for this hypothesis was that school sport participants might be more readily available to the self-efficacy information sources than those who do not participate in a school sport. The results of the study were not consistent with this rationale. High school sports create an environment that allows for self-efficacy information sources to thrive, but it may also vary from group to group. Furthermore, both groups in this sample might have had self-efficacy information sources equally available to them. A possible explanation is that the participants who did not play a school sport found self-efficacy information sources somewhere else (e.g., running clubs, friends, recreational sports).

The philosophical assumptions about sport may also lend information about the results. Sport is important because it gives people a chance to be active, but also it can be a positive social influence (Boone & Leadbetter, 2006; McHale, Vinden, Bush, Richer, Shaw, & Smith, 2005). In fact, interaction with a caring, non-related adult (i.e., coach or teacher) might positively affect a child's health and future (Findlay & Coplan, 2008; Fletcher, Nickerson, & Wright, 2003). However, it is natural to only focus of the positive aspects of sport, when in fact there are aspects of sport that may negatively affect self-efficacy for physical activity. Behaviours such as exclusion, tiered leagues, violent

rivalries, and emphasis of winning at all costs, might discourage people from playing sports and being active (Collins, 2004; Kimble, Russo, Bergman, & Galindo, 2010). These drawbacks of sport might add insight to why there was not a distinct and significant difference in physical activity self-efficacy between the two groups in this study.

The assumption that high school sport is important should also be addressed. This study has provided evidence in research that suggests that high school sport can have both positive and negative effects on adolescent students. The relevancy in sport is shown through its physical and social benefits, but as previously stated, sport can also have a negative effect on adolescents. Notwithstanding the negative aspects of sport, sport provides students the opportunity to be active, while learning about teamwork, leadership, and work ethic. There are 192 schools in Manitoba that participate in high school, and should these schools be spending money on high school sport? Yes, the opportunity to play high school sports should be available to students, in addition to music, drama, and art. The discourse regarding the participation in high school sport should continue, and the intent to improve the negative aspects of high school sport should be addressed. There are both positive and negative aspects of sport, as shown in this paper, but students should have the opportunity and the choice to play high school sport.

The assumptions about masculinity and how male adolescent should act, also might have affected the results in this study. It has been mentioned that research has shown a distinction between males and females regarding physical activity participation (Fredricks & Eccles, 2005; Slater & Tiggemann, 2011) and the internalization of gender

roles (Guillet, Sarrazin, Fontaine, & Brustad, 2006). The internalization of masculine gender roles might have affected the participants in this study, regardless of whether they played a high school sport or not. The participants might have reported high levels of physical activity and self-efficacy based on an internalization of how masculine males are supposed to behave. Specifically, by internalizing gender roles, the males in this study might have had the inclination to report high levels of self-efficacy and physical activity participation to stay consistent with the hegemonic ideas oh how males should act. This also may have contributed to the lack of variability between sport participants and non-participants because both groups might feel the same inclination to express high levels of physical activity and self-efficacy. Also, masculinity is an important sociological factor in sport choice. Teammates and coaches might reinforce the assumptions about hegemonic masculinity in a team sport setting, but there are also individual sports in which participants show a myriad of masculine traits. In team sports, the locker room is a place where teammates can display their masculinity before and after practice and games, but some participants might not feel comfortable in this setting. Some participants might move from team to individual sports for reasons relating to how masculine males are expected to behave in current society. This movement from team to individual sports may have affected the sample in this study, considering that the sport participant group did not include individual sport participants.

The strengths of this study are that it showed a significant relationship between physical activity self-efficacy and physical activity participation in adolescent males. The results of this study were consistent with the first hypothesis, and provided statistically significant to support it. This study, however, did not provide statistically significant

results to support the second hypothesis; it could not support the notion that school sport participation statistically related to the physical activity participation nor physical activity self-efficacy. However, the results of this study provide important information about physical activity and psychosocial factors that are related to participation.

These findings are important because it lends information to what makes people engage in active behaviour. Specifically, it suggests that people who feel more confident about physical activity tend to participate in more physical activity. This insinuates that physical activity participation can be encouraged in individuals using self-efficacy as a target. The results of this study showed that physical activity and self-efficacy are linked. It supports the notion that a person's confidence in their ability to be active can have a positive impact on their participation in physical activity. The importance of physical activity is stated previously in this study, and the results of this study provide insight about what drives people to be physically active. The importance of this research is in the fact that it can give us a better understanding about how to encourage people to remain active for their lifespan.

Limitations

Although this study provides pertinent information in the areas of physical activity and health, there are some limitations. First, the fact that the data was self-reported might have affected the results of this study. There is always a possibility that participants will have biased responses when using self-reported data (Deforche, Van Dyck, Verloigne, &De Bourdeauhuij, 2010; Motl, 2002; Neumark-Sztainer, 2003; Spence, 2010). To combat this limitation, future studies might benefit from unbiased forms of data collection. For instance, instead of using a self-reported physical activity

questionnaire each participant could wear an accelerometer to measure physical activity participation, similar to a recent study (Colley et al., 2011). Using this unbiased form of data collection might help eliminate the chance for biased results. Next, the use of the PAQ-A survey might have limited this research. Specifically, the survey included certain physical activities that might not have been realistic for adolescent males (i.e., tag, dance). A possible way to diminish this limitation would have been to amend the PAQ-A survey. The unrealistic physical activities for high school males should have been omitted from the survey, and some additional physical activities (i.e., weightlifting, wrestling) should have been added. Last, the use of only one high school sport as the criteria for the 'sport participant' group might not have provided distinct enough groups for this study. Future research would benefit from using two or more high school sports as the criteria because it might create more distinct groups.

The school that was sampled was private, with an annual tuition fee, so it is safe to assume that the sample in this study was generally from the same socio-economic class. This might have limited the results because it was a fairly homogenous group, with similar opportunity to sport and physical activity, based on socio-economic class.

Future Research Considerations

The benefit of this line of research is that it can be applied to many different sample groups. Specifically, this same study can be applied to younger children, different social classes, and females. Since this research established a relationship between physical activity self-efficacy and physical activity participation in adolescent males, it is natural to apply this research to a sample of adolescent females. Furthermore, studies involving the comparison between genders regarding self-efficacy and physical activity

would be noteworthy, especially because research (Bois, Sarrazin, Brustad, Touilloud, & Cury, 2002; Fredricks & Eccles, 2005) has shown sociological sex differences regarding sport and physical activity.

When trying to understand what makes children and adolescents active, there might be opportunity to research the method of delivery in physical education instead of comparing sport participation to non-participation. Ultimately, this could contribute to a set of structured information aids (e.g., SCORE! Program), which intend to encourage the increase in self-efficacy, and thus increase physical activity participation. Parents, teachers, and coaches would be the best people to deliver this self-efficacy information aid. These mentors could include a self-efficacy aid in their practice plans, with the goal of increasing physical activity self-efficacy so that youth have a better chance of continuing to be physically active throughout their lives. Also, this research could inform how schools formulate and deliver their physical education program. Specifically, educators might structure their physical education with part of the goal being to increase self-efficacy for physical activity. Physical education could be an opportunity for not only physical activity and sport participation, but also for learning how to motivate through increasing self-efficacy. Future studies could test these exercises on a sample of participants to see if it increases self-efficacy for physical activity. Further, if there were significant results, a self-efficacy information aid could successfully be included in sport practices and physical education classes. Sport participants and students might greatly benefit from an increased exposure to self-efficacy exercises.

The school that was sampled was private, with an annual tuition fee, so it is safe to assume that the sample in this study was generally from the same socio-economic

class. This might have limited the results because it was a fairly homogenous group, with similar opportunity to sport and physical activity, based on socio-economic class. In the future, it might be interesting to sample groups from different socio-economic class, including people who do not have the same opportunities to participate in sport and physical activity. These groups might include inner city schools and aboriginal communities. Research using these groups would give a broader insight because it would lend information about samples from a wide variety of social and economic classes.

Lastly, there is interesting research regarding comparing general efficacy in adolescents, and how it might translate to physical activity self-efficacy. Its possible that adolescents with general efficacy and feelings of control over other parts of their lives, might be more inclined to feel efficacious about physical activity. For example, research showed that both academic self-efficacy and academic self-concept were linked to desired student outcomes, including persistence, intrinsic motivation (Bandura, 1997; Skaalvik, 1997), and the adoption of task and achievement goals (Bong, 2001; Skaalvik & Skaalvik, 2005). These results may help to understand physical activity adherence, and research examining the possible link between academic self-efficacy and physical activity participation would be interesting.

Conclusion

Research has shown that a physically active lifestyle leads to good health, and that physically active people live longer and healthier lives (Erikssen, Liestol, & Bjornholt, 1998; Warburton, Nicol, & Bredin, 2006). Despite the commonly known negative factors associated with inactivity, many people are still inactive, proven by the fact that 85% of Canadian adults currently do not meet the recommended amount of daily physical

activity (Colley et al., 2011; Shields et al., 2010). Particularly, there is a large incidence of physical inactivity in youth throughout the world. (Pate et al., 2002; Colley et al., 2011). The current research aimed to build upon the past studies regarding the relationship between physical activity self-efficacy and physical activity participation. Also, this research explored the possibility that there may be a discrepancy in physical activity self-efficacy between school sport participants and non-participants.

In this study, it was found that physical activity significantly predicted variability in physical activity self-efficacy among high school males. The fact that there was a positive relationship between the two variables suggested that one's self-efficacy for activity was related to his ability to participate in physical activity. This finding was consistent with the results of previous research, which stated that self-efficacy was significantly related to physical activity behaviour (Von Ah, Ngamvitroj, Park, & Kang, 2004), specifically in high school aged participants (Allison, Dwyer, & Makin, 1999: Dwyer et al., 2012). The regression showed that SEPAQ score can predict some variability in PAQ-A scores, however high school sport participation did not significantly predict active behaviour or self-efficacy in this sample. There was no significant evidence supporting the notion that school-sport performance affected SEPAQ performance. There are negative aspects of sport that may have contributed to the lack of distinction between the two sample groups. Behaviours such as exclusion, tiered leagues, violent rivalries, and emphasis of winning at all costs, might discourage people from playing sports and being active (Collins, 2004; Kimble, Russo, Bergman, & Galindo, 2010). These drawbacks of sport might add insight to why there was not a distinct and significant difference in physical activity self-efficacy between the school sport participants and

non-participants.

Despite the fact that there were no significant results to support the hypothesis that school sport participation can affect the variability of self-efficacy for physical activity, there was still a significant relationship between self-efficacy for physical activity and physical activity participation. This suggests that self-efficacy might be best served as a tool for increasing physical activity adherence through physical education, and not necessarily sport participation. Specifically, physical educators might benefit from using psychosocial information aids to encourage psychosocial growth, which might encourage active behaviour. If physical educators can focus their attention on improving self-efficacy in all students, sport participants and non-participants alike, then all students might have an increased chance of remaining active. The significant relationship between self-efficacy and physical activity provides insight for physical educators about how to promote physical activity in high school males.

The implications for this research are that they can lend information about physical activity participation, and a specific determinant that affects it. This study could inform physical educators by providing information about how physical activity self-efficacy may affect current physical activity participation in young males. Specifically, physical educators should be highlighting the physical and health benefits of physical activity, but also targeting psychosocial skills like self-efficacy. The intent should be to use the improvement of self-efficacy as a vehicle for promoting physically active behaviour. This research should continue by using samples from different ages, genders, and socioeconomic classes to explore the possibility that these results would be consistent across different demographics. The evidence for the relationship between physical

activity self-efficacy and physical activity participation is apparent in the results of this study, and these results should motivate physical educators, coaches, and parents to use self-efficacy to promote healthy lifestyles in adolescent males.

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Appendix A

Physical Activity Questionnaire-Adolescents (PAQ-A)

Physical Activity Questionnaire (High School)

Name:_____ Age:_____

Sex: M_____ F_____ Grade:_____

Teacher:_____

We are trying to find out about your level of physical activity from ***the last 7 days*** (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

3. There are no right and wrong answers — this is not a test.
4. Please answer all the questions as honestly and accurately as you can — this is very important.

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1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Skipping	❍	❍	❍	❍	❍
Rowing/canoeing	❍	❍	❍	❍	❍
In-line skating	❍	❍	❍	❍	❍
Tag	❍	❍	❍	❍	❍
Walking for exercise	❍	❍	❍	❍	❍
Bicycling	❍	❍	❍	❍	❍
Jogging or running	❍	❍	❍	❍	❍
Aerobics	❍	❍	❍	❍	❍
Swimming	❍	❍	❍	❍	❍
Baseball, softball	❍	❍	❍	❍	❍
Dance	❍	❍	❍	❍	❍
Football	❍	❍	❍	❍	❍
Badminton	❍	❍	❍	❍	❍
Skateboarding	❍	❍	❍	❍	❍
Soccer	❍	❍	❍	❍	❍
Street hockey	❍	❍	❍	❍	❍
Volleyball	❍	❍	❍	❍	❍
Floor hockey	❍	❍	❍	❍	❍
Basketball	❍	❍	❍	❍	❍
Ice skating	❍	❍	❍	❍	❍
Cross-country skiing	❍	❍	❍	❍	❍
Ice hockey/ringette	❍	❍	❍	❍	❍
Other:					
_____	❍	❍	❍	❍	❍
_____	❍	❍	❍	❍	❍

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

I don't do PE ❍
Hardly ever ❍
Sometimes ❍
Quite often ❍
Always ❍

3. In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)

Sat down (talking, reading, doing schoolwork) ❍
Stood around or walked around ❍
Ran or played a little bit ❍
Ran around and played quite a bit ❍
Ran and played hard most of the time ❍

4. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

None ❍
1 time last week ❍
2 or 3 times last week ❍
4 times last week ❍
5 times last week ❍

5. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

None ❍
1 time last week ❍
2 or 3 times last week ❍
4 or 5 last week ❍
6 or 7 times last week ❍

6. *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

None ❍
1 time ❍
2 — 3 times ❍
4 — 5 times ❍
6 or more times ❍

7. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

F. All or most of my free time was spent doing things that involve little physical effort .....……❍

G. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) .....……....❍

H. I often (3 — 4 times last week) did physical things in my free time .....……..❍

I. I quite often (5 — 6 times last week) did physical things in my free time ……...❍

J. I very often (7 or more times last week) did physical things in my free time …..❍

8. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday	❍	❍	❍	❍	❍
Tuesday	❍	❍	❍	❍	❍
Wednesday	❍	❍	❍	❍	❍
Thursday	❍	❍	❍	❍	❍
Friday	❍	❍	❍	❍	❍
Saturday	❍	❍	❍	❍	❍
Sunday	❍	❍	❍	❍	❍

9. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

Yes .....……❍
No .....❍

If Yes, what prevented you? _____

Appendix B

Self-Efficacy for Physical Activity Questionnaire (SEPAQ)

The Self-Efficacy Scale

In answering the following questions you will be asked to think about how confident you are that you can participate in physical activities that are described as light / moderate / hard. The word "confident" refers to the belief that you have in yourself that you can do something well. Please circle the appropriate percentage (%) indicating your response for each of the questions.

Light activity: You are moving around, but your heart rate and breathing do not increase very much. You probably will not be sweating doing these unless the weather is really hot. You would be able to talk easily through the activity.

Using the scale below, please check the appropriate response (0-100%) for each question.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at all confident			Really not confident		Kind of confident		Reasonably confident		Almost confident	Completely confident

1. How confident are you that you can complete **10 minutes** of physical activity at a **light** intensity level **five** OR MORE days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

2. How confident are you that you can complete **30 minutes** of physical activity at a **light** intensity level **five** days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

3. How confident are you that you can complete **60 minutes** of physical activity at a **light** intensity level **five** days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

Moderate activity: Your breathing and heart rate increase. You may start to sweat, your legs might feel a little bit tired and you may feel out of breath. You may also find it hard to talk during the activity.

Using the scale below, please check the appropriate response (0-100%) for each question.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at all confident			Really not confident		Kind of confident		Reasonably confident		Almost confident	Completely confident

4. How confident are you that you can complete **10 minutes** of physical activity at a **moderate** intensity level **five** days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

5. How confident are you that you can complete **30 minutes** of physical activity at a **moderate** intensity level **five** days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

6. How confident are you that you can complete **60 minutes** of physical activity at a **moderate** intensity level **five** days next week?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
□ □ □ □ □ □ □ □ □ □ □

Vigorous activity: your heart beats very fast, your breathing is fast and you start sweating. You may feel exhausted and out of breath. Your legs would probably feel heavy. It would be very hard to talk during the activity.

Using the scale below, please check the appropriate response (0-100%) for each question.

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at all confident			Really not confident		Kind of confident		Reasonably confident		Almost confident	Completely confident

7. How confident are you that you can complete **10 minutes** of physical activity at a **hard** intensity level **five** OR MORE days next week?

0% ☐ 10% ☐ 20% ☐ 30% ☐ 40% ☐ 50% ☐ 60% ☐ 70% ☐ 80% ☐ 90% ☐ 100% ☐

8. How confident are you that you can complete **30 minutes** of physical activity at a **hard** intensity level **five** days next week?

0% ☐ 10% ☐ 20% ☐ 30% ☐ 40% ☐ 50% ☐ 60% ☐ 70% ☐ 80% ☐ 90% ☐ 100% ☐

9. How confident are you that you can complete **60 minutes** of physical activity at a **hard** intensity level **five** days next week?

0% ☐ 10% ☐ 20% ☐ 30% ☐ 40% ☐ 50% ☐ 60% ☐ 70% ☐ 80% ☐ 90% ☐ 100% ☐

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Appendix C

Informed Consent

Research Project Title: High school sport participation: Does it have an impact on physical activity participation and self-efficacy?

Researchers: Michael Downs, Primary Researcher, Faculty of Kinesiology and Recreation Management, Supervising Advisor: Dr. Leisha Strachan

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

My name is Michael Downs and I am a Master's student at the University of Manitoba in the Faculty of Kinesiology and Recreation Management. I am conducting a research study entitled High school sport participation: Does it have an impact on physical activity participation and self-efficacy? Research has shown inactivity is a problem in Canada today. The increase of screen time activities (i.e., television, computers, video games) and decrease in outdoor activities has allowed many youths to become sedentary. My

research focuses on the factors that are linked to physical activity participation in youth, namely through physical activity self-efficacy (i.e., one's confidence in their ability to perform physical activity).

I am requesting your voluntary participation in this study, which I hope will lead to increased knowledge and information regarding the psychosocial factors that contribute to the choice to stay active. This research can possibly lend valuable information to educators, coaches and parents regarding the associations between physical activity participation and physical activity self-efficacy. Furthermore, this information might be used to influence physical education and sport policy. This research will also provide the coach, parent, teacher, and sport administrator with a more complete view of the psychosocial factors that affect physical activity participation in youth, with the possibility that participation might also be a factor.

This research study is guided by the following questions:

1. Does the continuous variable 'amount of time spent participating in physical activity' predict the performance on a physical activity self-efficacy scale?
2. Does participation in organized school sport predict self-efficacy for physical activity in high school males?

Participation in this study during the winter of 2013 will involve:

-The completion of the Physical Activity Questionnaire (PAQ-A) and The Self-Efficacy for Daily Physical Activity Questionnaire (SEPAQ)(should take about 30 minutes total)

Information provided to the primary researcher and supervising advisor (Michael Downs or Dr. Leisha Strachan) will not be discussed or disclosed to any other individual. The data obtained during the course of this study will be stored in a secure location (e.g., locked file cabinet in room 123B Frank Kennedy Center) that will only be accessible to the primary researcher. The results of the study may be used in thesis research, published in academic journals and presented at conferences or workshops. Names will not be associated with any of the surveys and the identities of those who participated in the study will be protected in any presentation or publication. Any identifiable information given by participants will be removed or changed in order to keep their identity safe. All data pertaining to the study will be shredded after a five-year period.

There are no known physical, psychological, economic, or social risks associated with participation in this study. You may refuse to answer any questions. You may withdraw from the study by contacting the primary researcher (Michael Downs). Refusal to participate or withdrawal from this study will have no consequences whatsoever. Any data relating to individuals who withdraw from the study will be shredded.

This study is being completed as thesis research in accordance with the University of Manitoba. Dr. Leisha Strachan is the supervising advisors for this research and can be

contacted at leisha.strachan@ad.umanitoba.ca.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

To be sent a summary of the results of this study please write your name and address:

Name:_____

Address:

_____

_____

Participant's Signature:_____ Date _____

Parent/Guardian Signature:_____Date _____

Primary Researcher's Signature:_____ Date _____

Primary Researcher:

Michael Downs

Graduate Student, Faculty of Kinesiology and Recreation Management

University of Manitoba

Phone (204) 781-4486

umdownsm@cc.umanitoba.ca

This research has been approved by the Education/Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above named persons or the ENREB Human Ethics Coordinator, Margaret Bowman, at margaret_bowman@umanitoba.ca or 474-7122.

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Appendix D

Participant Assent

Research Project Title: High school sport participation: Does it have an impact on physical activity participation and self-efficacy?

Researchers: Michael Downs, Primary Researcher, Faculty of Kinesiology and Recreation Management, Supervising Advisor: Dr. Leisha Strachan

This letter will give you an idea about what I am researching and how you can help. If you have any questions, please ask me, I would be happy to answer them. Read this letter carefully…

I am doing a study about how high school students view physical activity. More specifically, some guys might feel very confident in their ability to be physically active, but others may not. I would like to study these differences. I am hoping to have a lot of help from you in this study. The results will help to learn more about how to get people to live healthy, active lives!

There are 2 simple steps to this study

1) You will be asked to fill a questionnaire that measures how much physical activity you participate in.

2) You will be asked to fill out another questionnaire that asks how confident you are in your ability to participate in physical activity, in different situations.

I want you to know that I will not be telling your teachers, parents, or any other kids what you write. Only the researcher and supervisors will be able to get into any of the information you provide to me. A report will be put together and may be presented or published in a journal. But no one will know who the names of any students that are in my study.

Your mom, dad, and/or guardian have said that you are allowed to be in this study. Would you like to help? If you say 'no', that is OK. If you start the study then decide you don't want to do it anymore, that's OK too! You can ask questions at any time, now or later, I would be happy to answer them.

If you would like to help, please sign your name on the line below:

Name (please print): _____

Signature: _____

Date: _____

Primary Researcher:

Michael Downs

Graduate Student Faculty of Kinesiology and Recreation Management

University of Manitoba

Phone (204) 781-4486

umdownsm@cc.umanitoba.ca

This research has been approved by the Education/Nursing Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above named persons or the ENREB Human Ethics Coordinator, Margaret Bowman, at margaret_bowman@umanitoba.ca or 474-7122.