

An Analysis of Motivation and Motivational Climate in Physical Education Class  
of Enrolled and Non-Enrolled Female Adolescent Students

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## Abstract

This study investigated female adolescent students' motivation towards high school physical education (PE) class and the relationship of motivational class climate of enrolled and non-enrolled female adolescent students. Data collected via the Physical Activity Questionnaire for Older Children (PAQ-C), the Behavioural Regulation in Exercise Questionnaire-2 (BREQ-2), the Motives for Physical Activities Measure–Revised (MPAM-R), and the Physical Education Class Climate Scale (PECCS) assessed students' motivation, participation levels, and motivational class climate. Participants comprised 239 females aged 13 to 15, classified into 4 groups: (a) grade 9 students enrolled in PE who planned to enroll the following year, (b) enrolled grade 9 students who did not plan to enroll the following year, (c) enrolled grade 10 students, and (d) non-enrolled grade 10 students. As no differences were detected between grades, categories were collapsed into enrolled and non-enrolled groups. Based on BREQ-2, MPAM-R, and PECCS results, enrolled groups exhibited greater intrinsic motivation to participate, greater levels of intrinsic and extrinsic motivation characteristics (with the exception of the appearance motive), and a perceived class mastery orientation, respectively. Study findings underscore the growing concern expressed about adolescents' sedentary lifestyles and the need for continued research to understand female adolescents' motivation towards PE and physical activity. Recommendations are made to encourage female adolescent students' enrolment in PE classes throughout high school.

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## **Chapter One: Introduction**

Many of today's youth do not have the time—or make the time—to include physical activity in their everyday lives. Physical activity is defined as bodily movement produced by skeletal muscle which results in an increase of energy expenditure above resting levels (Katzmaryk & Tremblay, 2007). According to the U.K. Department of Health (as cited in Ntoumanis, Pensgaard, Martin, & Pipe, 2004) and to Birch (2006), physical activity during adolescence enhances healthy growth and development and helps adolescents to maintain a balance of energy, psychological health, and social interaction. In addition, adolescents who engage in increased levels of physical activity are more apt to become physically active adults. According to Birch and to Craig and Cameron (2004), reporting on behalf of the Canadian Fitness and Lifestyle Research Institute [CFLRI], 56% of Canadians between ages 5 to 19 are not engaged in a level of physical activity that is conducive to optimal growth and development. Research indicates that Canadian girls are significantly less active than Canadian boys: only 38% of girls aged 5 to 12 and 30% of adolescent girls aged 12 to 17 are considered active enough for optimal growth and development, compared to 48% and 40% of boys and adolescent boys, respectively, in similar age categories (Birch, 2006; Craig & Cameron, 2004).

### **Precursors to Physical (In)Activity**

Studies show that females without a history of physical activity during childhood and adolescence are less likely to become physically active adults (Sallis, Hovell, & Hofstetter, 1992; Trudeau, Laurencelle, Tremblay, Rajic, & Shephard, 1999; Van Gyn, Higgins, Gaul, & Gibbons, 2000), and that physical activity declines from a relatively young age, with the steepest decline occurring between the ages of 13 and 18 (Hausenblas, Nigg, Symons Downs, & Connaughton, 2002; Sallis, 2000). Physical inactivity connotes individuals who are inactive or sedentary in

their everyday lives, and is defined as an energy-expenditure of less than 1.5kcal/kg/day (Faulkner et al., 2007). Kirshnit, Ham, and Richards (1989) indicate that childhood obesity and concern about body image are directly correlated to declining physical activity among female adolescents.

For more than a century, schools have played a key role in keeping Canadian youths physically active. Physical education (PE) is “designed to develop the skills, knowledge, and attitudes necessary for participating in active, healthy living” (Alberta Centre for Active Living [ACAL], 2007, para. 1). According to the Canadian Association for Health, Physical Education, Recreation and Dance (CAHPERD), “all students from kindergarten to grade 12 should take part in quality daily PE at school totalling at least 150 minutes per week” (as cited in ACAL, 2007, para. 4). However, despite such emphasis on physical activity, students in the Ontario secondary school system are only required to take PE until grade 9; moreover, many schools offer less than 60 minutes of PE per week, and fewer than 20% of children between ages 6 and 12 participate in daily PE activities (Craig & Cameron, 2004).

Studies examining participation in PE classes have detected declining enrolment in such classes over the years (Papacharisis & Goudas, 2003; Van Wersch, Trew, & Turner, 1992). In 1999, for instance, 70.3% of secondary school students were enrolled in PE classes in Ontario, while the number decreased to 60.3% of students by 2005 (Faulkner et al., 2007), with a greater percentage of adolescent males than females enrolled in such classes (Faulkner et al., 2007). The above data highlights the need for a supportive environment and decisive action that will encourage students—particularly females—to pursue PE with an end goal of lifetime participation in physical activity, and the development of such healthy life skills learned through PE during adolescence will help influence their possible continued use throughout adulthood.

However, in order to increase students' physical activity levels as well as their interest in PE, they must first be sufficiently motivated to participate in PE lessons (Ntoumanis, 2001). A large amount of students are intrinsically motivated to participate in PE classes, but many adolescents are extrinsically motivated or simply lack the motivation to participate (Ntoumanis, 2001; Ntoumanis, Pensgaard, Martin, & Pipe, 2004). Understanding such motivational factors, then, will assist educators and other stakeholders to improve adolescent females' interest in and ability to participate in physical activities.

### **Theoretical Framework**

The Self-determination theory (SDT) involves the study of human motivation, personality development, and well-being (Ryan & Deci, 2000). The SDT is a framework that has been used to examine motivation in PE as well as other areas (Deci & Ryan, 1985; Ntoumanis, 2001; Ryan & Deci, 2000). SDT encompasses three types of behavioural regulation corresponding to decreasing degrees of self-determined motivation: (a) intrinsic motivation, (b) extrinsic motivation, and (c) amotivation (Ntoumanis, 2001).

**Intrinsic motivation.** Intrinsic motivation represents the highest degree of self-determined motivation and refers to situations in which individuals freely participate in activities that they find interesting and enjoyable, and which offer the opportunity for learning (Ntoumanis, 2001; Vallerand et al., 1992). Deci and Ryan (1991) and Papacharisis and Goudas (2003) identified also that intrinsically motivated individuals showed greater self-confidence when involved in physical activity.

**Extrinsic motivation.** Extrinsic motivation corresponds to individuals who perform an activity because they value its associated outcomes (i.e., internal or external rewards) more than the activity itself (Ntoumanis, 2001). Based on previous research involving the SDT, Goudas,

Biddle, and Fox (1994) identified three types of extrinsic motivation that are applicable to PE: identified regulation, introjected regulation, and external regulation.

***Identified regulation.*** This first type of extrinsic motivation corresponds to behaviours that entail a high degree of self-determined motivation (Ntoumanis, 2001; Ryan & Deci, 2000). Individuals who demonstrate a high degree of identified regulation have internalized and appreciate the value of certain behaviours and activities that they perform out of choice, though without necessarily enjoying those (Ntoumanis, 2001); for example, some students may participate in PE because they value the health benefits associated with physical activity.

***Introjected regulation.*** The second type of extrinsic motivation describes extrinsically motivated behaviours that have been only slightly internalized and that often are performed out of feelings of guilt or shame (Ntoumanis, 2001). For example, some students may participate in PE in order to please others—perhaps a parent, a coach or, in the case of some adolescent females, a boyfriend.

***External regulation.*** Lastly, external regulation represents the lowest degree of extrinsic motivation. It refers to individuals' behaviours that are carried out in order to attain specific rewards (e.g., improved social status among peers) or to avoid punishment—such as the imposition of punitive “extra laps” or other such exercises by an authoritative (and/or displeased) coach (Ntoumanis, 2001).

### **Amotivation**

Finally, Deci and Ryan (1985) identify the third type of behavioural regulation as amotivation. According to Ntoumanis (2001), amotivation represents the absence of motivation and is evident when individuals lack the intention and/or willingness to engage in a particular behaviour. Amotivation is often the result of individuals' feelings of incompetence which,

combined with the individuals' sense of powerlessness frequently corresponds to their decisions to drop out of PE (Ntoumanis et al., 2004).

Ntoumanis (2001) addresses the different types of motivation discussed above based on Vallerand's (1997) research. As Ntoumanis notes, Vallerand's research outlines a number of social factors (e.g., autonomy-supportive or controlling teaching styles) that can affect the various types of motivation due to the fundamental human need for autonomy, competence, and connection with others. Ntoumanis argues that social factors satisfying such needs will promote self-determined forms of motivation, whereas those that undermine such needs will result in lower-degree extrinsic motivation and amotivation. To summarize, both Ntoumanis and Vallerand indicate the various types of motivation can predict a number of affective, behavioural, and cognitive outcomes; intrinsic motivation and identified regulation predict the most positive outcomes, while amotivation and external regulation predict the most negative outcomes.

### **Motivational Climate**

Few studies examining students' physical education participation have analyzed the relationship between adolescents' motivation and teachers' pedagogical practices; however, those that have done so indicate students' motivation levels may be affected by teachers' formation of a suitable motivational climate (Perlman & Karp, 2007). Within the context of high school PE, the term "motivational climate" refers to students' perceptions of the motivational cues and expectations that the teacher places upon the class to encourage a particular goal orientation (Vazou, Ntoumanis, & Duda, 2005). Treasure and Roberts (1995) indicate that teachers who place a high value on the process of learning help develop student self-confidence and intrinsic motivation; consequently, the establishment of an appropriate

motivational climate is correlated to teaching practices that enhance student motivation and hence his/her interest and ability to participate in PE. The following sections discuss two types of motivational climate identified in the literature: class mastery and a class performance orientation.

**Class mastery orientation.** Class mastery orientation refers to a motivational climate that promotes cooperative teamwork among classmates, focuses on self-improvement and effort, and recognizes that mistakes are a part of learning (Vazou et al., 2005). Ames (1992) argues that teachers who reinforce cooperation tacitly encourage students to believe that they are valued in the learning environment.

**Class performance orientation.** Class performance orientation, on the other hand, corresponds to a motivational climate that highlights competition among students, emphasizes the outcomes of student effort and views mistakes as evidence of inadequate learning and/or performance (Vazou et al., 2005). Vallerand, Gauvin, and Halliwell (1986) stress that class performance orientations are motivationally detrimental because such climates undermine the intrinsic tendencies of individuals to seek success and approval amongst their peers. A class performance orientation may be established knowingly or unknowingly by the supervising teacher, but regardless it will negatively impact the students' intrinsic motivation towards the given activity.

To summarize, motivation theorists and researchers such as Haertel, Walberg, and Haertel (1981) show strong associations between student learning outcomes and the nature of the classroom environment, while others such as Escarti and Gutiérrez (2001) highlight the important role of motivation and motivational class climate related to adolescent perceptions of physical education. As I will discuss in chapter 2, the literature underscores the growing

concern regarding adolescents' sedentary lifestyles and, more explicitly, the need to better understand female adolescents' motivation towards PE. In short, it is important to identify factors and practices that encourage female students to enroll in PE classes during their high-school years so they might continue to make healthier lifestyle choices throughout adulthood.

### **Relevance of This Study**

The purpose of this study is to analyze female adolescents' motivation for PE and differences (if any) between enrolled and non-enrolled students' perceptions of motivational class climate in PE classes. To date, research corresponding to adolescents' participation in physical education highlights the major benefits of being physically active during the teenage years, such as the following benefits outlined by Fishburne and Hickson (2006): ~~the~~ development of a level of personal fitness that supports healthy living; a skill base that enables children and youth to successfully participate in a variety of physical activities; and development of the habit of life-long participation in health-enhancing activities" (p. 3). Nevertheless, although the physical benefits of exercise may seem obvious to PE teachers and to individuals who participate in such activities, many female students end their involvement in PE beyond the mandatory grade 9 class.

Consequently, this study aims to discover why female adolescents discontinue their participation in PE and to determine what could be done to encourage their ongoing enrolment in PE classes and, hence, the likelihood of their having healthier lifestyles beyond adolescence and high school. The study used the Behavioural Regulation in Exercise Questionnaire (BREQ-2), the Motives for Physical Activities Measure–Revised (MPAM-R), and the Physical Education Class Climate Scale (PECCS) to aid in the examination of female adolescents' participation and motivation levels in PE in order to answer the following questions: (a) Based

on the BREQ-2, the MPAM-R, and the PECCS results, what type of motivation do female adolescent students who are enrolled in PE class demonstrate? (b) Do such motivational characteristics differ from those of students who are not enrolled in PE class?

## **Chapter Two: Literature Review**

As noted in the previous chapter, physical activity positively influences physical and psychological health, and is important at all stages of life (Papacharisis & Goudas, 2003; Sallis & Patrick, 1994); however, PE classes in Ontario schools are comprised of students with a variety of ability and interest levels. Female students' voluntary integration of physical activity into their daily lives depends substantially upon their level of intrinsic motivation (Papacharisis & Goudas), and theorists such as Goudas and Biddle (1994) have indicated that the motivational class climate established by teachers and peer groups can have a direct impact on adolescent females' intrinsic motivation. This chapter discusses the aforementioned studies as well as other previous research that can shed light on the present study's primary questions: (a) What type of motivation do female adolescent students who are enrolled in physical education class demonstrate? And (b) Do such characteristics differ from those of students who are not enrolled in physical education?

### **Importance of Physical Activity**

Participation in physical activity is an important aspect of an individual's total health. Daley's (2002) investigation of the relationship between physical activity and self-perception amongst 14-15 year olds in the U.K. have indicated a strong positive relationship between involvement in regular physical activity and mental health. Still, adolescent participation in physical activity continues to decline, with the largest decline occurring between ages 13 and 18; unfortunately, the reasons for such decline remain largely unknown (Hausenblas et al., 2002; Sallis, 2000).

As noted in chapter 1, Katzmarzyk and Tremblay (2007) refer to physical activity as bodily movement produced by skeletal muscle which results in an increase of energy expenditure

above resting levels. Physical activity has been known to burn calories, increase energy expenditure, and decrease an individual's basal metabolic rate (Haywood & Getchell, 2005). Physical activity positively influences physical and psychological health, and is important at all stages of life (Papacharisis & Goudas, 2003; Sallis & Patrick, 1994). It is believed that physical activity can also enhance one's self-esteem, body-image, and personal growth (Kirshnit et al., 1989), as research over the past four decades has demonstrated that childhood and adolescence are periods when lifestyle patterns are formed (Cunnane, 1993).

The literature indicates that participation in regular physical activity is beneficial during adolescence and throughout adulthood (Faulkner et al., 2007). Adolescents who establish a regular physical activity routine improve cardio-respiratory fitness by means of endurance activities, strength conditioning by means of resistance exercises, and flexibility by means of stretching exercises. Moreover, teens' participation in physical activities is associated with improved academic performance, parental relationships, and self-esteem; decreased levels of anger, anxiety and depression, psychological stress, and other mental health problems; and reduced tobacco, alcohol, and marijuana usage (Valois, Zullig, Huebner, & Drane, 2004).

The increasing prevalence of physical inactivity—defined here simply as the absence of bodily movement and energy expenditure beyond resting levels—among adolescent students in North America is now recognized as a major public health concern (Allison, Adlaf, Dwyer, Lysy, & Irving, 2007). Allison et al.'s cross-national study of adolescents in Canada and the U.S., for instance, shows that approximately 21,000 premature deaths are attributed annually to physical inactivity. Allison et al. note further that the cost of treating physical inactivity-related illnesses such as heart disease, stroke, colon cancer, diabetes, obesity, and osteoporosis in

Canada has been estimated at \$2.1 billion, representing 2.5% of the country's total indirect health care costs.

Regardless of the grim statistics noted above, numerous studies report an increase in physical inactivity amongst adolescents, including those in Ontario. Allison et al. (2007) indicate that physical activity declines sharply during adolescence, while Papacharisis and Goudas (2003) highlight a reduction in PE enrolment during students' first few years in secondary school. More specifically still, Faulkner et al. (2007) reveal a significant linear decrease in the percentage of students enrolled in Ontario high school PE classes during 1999-2005—declining from 70.3% in 1999 to 60.3% in 2005. Data from the latter studies are augmented by others showing a systematic decline in out-of-school physical activity levels among female youths (e.g., CFLRI, 1996; Edwards, 2003; Stephens & Craig, 1990; Van Gyn et al., 2000), and by still other research demonstrating that females without a history of physical activity during childhood and adolescence are less likely to be physically active—and hence healthy—adults (Sallis et al., 1992; Trudeau et al., 1999; Van Gyn et al., 2000). Overall, evidence of the decline in physical activity levels among female adolescents calls for reasonable solutions to such a disturbing trend towards unhealthy lifestyles. Consequently, the following section reviews sources that shed light on the importance of physical activity in female adolescents' daily lives.

### **Importance of Physical Education**

School-based PE programs provide regular, structured opportunities for students from Junior Kindergarten through Grade 9 to participate in health-enhancing activities, and they enable the opportunity for all children and youth to practice healthy habits regardless of their socioeconomic status. As Fishburne and Hickson (2006) posit, there is as much of a need to

develop children's physical literacy as there is their abilities in mathematics and language. Fishburne and Hickson found that children who are engaged in PE programs are more likely to: (a) perform as well or better academically than students who spend more time on academic curriculum and less on physical education; (b) develop lifelong, positive personal habits that may ward off future health problems; and (c) experience improved self-esteem and self-concept, and lower levels of anxiety and stress. Similarly, Cox, Smith, and Williams (2008) credit PE not only with improving children's physical activity levels, but also their related beliefs and behaviours (e.g., activity levels in physical education). Unfortunately, academic-related secondary school courses tailored primarily for students' college or university admission often take precedence over PE as an elective regardless of the latter's obvious benefits.

Pate, Ward, O'Neill, and Dowda (2007) examined explicitly the relationship between adolescents' participation in PE classes and their physical activity levels, and suggested that school-based PE can provide high school students with much-needed physical activity that they might not otherwise experience in their everyday lives. The U.S.-based Center for Disease Control and Prevention (CDC, 2006) similarly affirms that PE enrolment may be a particularly important source of physical activity for girls, who tend to be less active than boys. The CDC (2004) notes also that girls are less likely than boys to select PE when offered the choice to do so, while both Koca and Demirhan (2004) and Pate et al. state that girls are more likely to report less positive attitudes toward PE. Faulkner et al. (2007) address such concerns by suggesting that strategic collaboration between administration, faculty, and students is needed to encourage development of and participation in PE programs. As Faulkner et al. point out; adolescents experience extensive "personal change" during their high school years. This is a

period when adolescents develop new outlooks not only on their own identities but also on a range of scholastic activities such as classes, hobbies, peer groups, and athletics. Consequently, there is a need to better understand adolescent females' perspectives and their motivation to participate and maintain enrolment in health-enhancing environments such as PE class.

Researchers Bailey, Wellard, and Dismore (2004) completed a summer of research into girls' participation in sports and physical activities. They interviewed PE teachers in regards to why girls lose interest towards PE in the eighth and ninth grades. The teachers believe that issues surrounding changing clothes, sweating, and looking good were reasons why girls were opting out of PE at the secondary level. A secondary teacher believed that curriculum focusing on team sport activities also impacted withdrawal rates. It was also concluded that increased academic requirements at the high school level may deter some girls from taking PE classes, particularly when it is not a required course. Another contributing factor might be that girls who are actively engaged in extracurricular activities might feel that they do not need more PA and therefore do not elect to take PE when it becomes an elective. Family also plays a role influencing children's physical activity participation. Some researchers have argued that physical play opportunities depend greatly on the set of beliefs and expectations held by parents and are particularly significant in relation to gender.

Overall, as the above investigators and others such as Trudeau and Shephard (2005) observe, schools contribute to students' attitudes towards physical activity, and such activity positively influences physical activity into adulthood. However, critics such as Cox et al. (2008) build upon the latter conclusion and suggest that it is the quality rather than the quantity of PE experiences and programs that ultimately will encourage and interest adolescents to participate in school-based physical activities, which can be then carried on beyond the scope

of regular curriculum and into adulthood. Therefore, this study proposes to examine female adolescent's motivation and why female adolescents discontinue their participation and the motivational climate in their high school PE classes.

### **Role of the Physical Education Teacher**

Lonsdale, Sabiston, Raedeke, Ha, and Sum (2009) examined the relationship between adolescent students' self-determined motivation and their physical activity behaviour by comparing a teacher-led structured PE lesson with a free-choice PE class period during which time students were not explicitly directed to be active. Interestingly enough, Lonsdale et al. concluded that PE class environments that allow adolescent students the opportunity to make choices are likely to further promote positive physical activity behaviours; the implication, then, is that teachers' pedagogical practices—which include their interactions with students—affects students' motivation towards PE. Similarly, Cox and Williams (2008) examined aspects of the motivational climate and social context that contribute to students' feelings of autonomy and competence. They identified that students' perceptions of their relationships with their teachers are motivationally relevant and understudied in the PE setting. Teachers can create meaningful connections with their students by demonstrating emotional support or involvement, which consists of "earing, friendliness, understanding, dedication, and dependability" (Cox & Williams, 2008, p. 224) and "refers to the extent to which students believe that teachers value and establish personal relationships with them" (Patrick, Anderman, & Ryan, 2002, p. 95).

Goudas et al. (1994) indicate that PE teachers' focus on students' personal improvement plays a role in the latter's performance level. Taylor, Ntoumanis, and Standage (2008) found that teachers' own self-determined need for motivation positively relates to how

classes may be influenced. Similarly, Escarti and Gutiérrez (2001) believe that the type of environment teachers create in their classes impacts the level of motivation and influences students' intentions. Legault, Green-Demers, and Pelletier (2006) noted that fostering a meaningful affiliation between teachers and students promotes a sense of student-belonging within the class.

### **Relationship of Physical Activity and Physical Education**

Various studies indicate that PE plays a central role in increasing adolescents' physical activity levels. Lonsdale et al. (2009) examined relationships between students' self-determined motivation and their physical-activity behaviour during a teacher-led structured PE lesson and a free-choice period in which they were not required to be active. Lonsdale et al.'s study— comprising 528 Hong Kong students (mean age = 15.78 years) in April-May 2007— used Situational Motivation Scale scores to form high and low self-determined motivation groups. Students wore a pedometer during a 20-minute structured basketball lesson and a 20-minute free choice period, during which time they did not receive instruction. ANOVA results revealed that self-determined motivation and PE class environments which provided students opportunities to make choices were related to greater levels of physical activity. Furthermore, physical activity levels between the high and low self-determined groups was greater in the free-choice period than the structured lesson, suggesting that self-determined motivation is especially important when students are not supervised. Lonsdale et al.'s findings indicate that promoting self-determined motivation may help PE programs to increase physical activity levels, foster self-initiated physical activity behaviours, and hence ultimately enhance adolescents' health.

Pate et al. (2007) investigated the association between PE enrolment and overall physical activity participation and suggested that school-based PE provides students with much-needed physical activity. Pate et al.'s study—which included three ethnically diverse cross-sectional samples of female students in grades 8, 9, and 12—found that girls enrolled in PE were more physically active at all three grade levels than those who were not enrolled. The study also concluded that the overall physical activity of girls in grades 8 and 9 was due primarily to their participation in PE class activities, and that the former group were no more active than the non-enrolled group outside of PE class. Pate et al. also found that grade 12 girls enrolled in PE were considerably more active than those who were not enrolled, and concluded that this was not surprising, as PE enrolment is an elective at the grade 12 level. These findings are important, because a significant decrease in physical activity observed in girls across adolescence can thus be identified as being more prevalent amongst those who do not enroll in PE.

### **Measuring Physical Activity and Motivation**

The reviewed literature corresponding to the above measures of motivation demonstrates that a physically active lifestyle can enhance or maintain one's physical and psychological health. It is troubling, then, that participation and enrolment in PE declines sharply during adolescence, as such a decline may herald and mirror patterns of reduced physical activity in adulthood. Nonetheless, the aforementioned studies provide a foundation upon which further research, including the present study, can focus specifically on the motivational factors that may impact female's adolescents' participation in physical activity. The Physical Activity Questionnaire for Older Children (PAQ-C) is a self-reporting measure widely used to assess physical activity in children in grades 4-8 who are 8-14 years of age

(Kowalski, Crocker, & Donen, 2004). Kowalski et al. (2004) developed the PAQ-C as both a valid and reliable tool to be used in motivation and physical activity studies. Voorhees et al. (2005) applied the PAQ-C instrument to assess the level of activity of females in specific settings, while Welk, Cordin, and Dale (2000) applied the PAQ-C as a tool to classify youth as either active or non-active, as did Welk and Wood (2000) who suggest that various levels of physical activity participation are associated with health benefits and/or health risks. Crocker, Bailey, Faulkner, Kowalski, and McGrath (1997) also believe the PAQ-C is a valid tool for assessing physical activity at various ages and provides a general measure of physical activity for youth.

In the study of motivation, the MPAM-R is used to predict an assortment of behavioural outcomes—such as participation and/or persistence in sport or exercise activity, well-being, and mental health—that can be attributed to different motives. As noted by Ryan, Frederick, Lepes, Rubio, and Sheldon (1997), the MPAM-R uses a 7-point Likert scale consisting of 30 items to assess participants' motives for engaging in physical activities, including both intrinsic motivation (interest and enjoyment, and competence) and extrinsic motivation (appearance, fitness, and social motivations). Wilson, Rodgers, and Fraser (2002) applied the MPAM-R in their cross-sectional study of female students and staff aged 18-74 years participating in an exercise class. They found that perceived autonomy support from friends was more favourably associated with identified and intrinsic regulations; and that autonomous (identified and intrinsic) exercise regulations were more strongly correlated with greater intentions to exercise. Frederick and Ryan (1993) investigated how participation motivation might vary by gender of participant and the type of the activity. A primary purpose of the study was to examine the relations between motivational orientation, level of

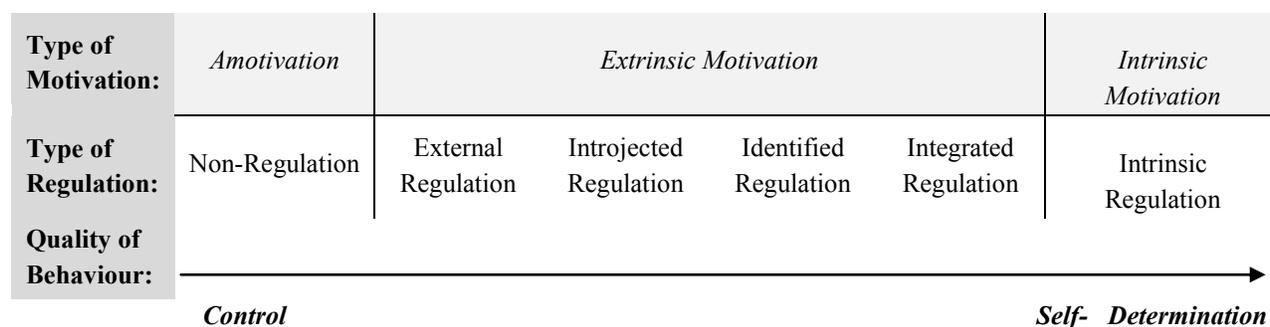
participation, and psychological outcomes of physical activity participation. Three prominent motivation participation factors in physical activities that can be applied to both individual sports and to exercise activities were measured. Three motivational participation factors identified: (a) interest and enjoyment (fun and enjoyment), (b) competence motivation (skill improvement and competition), and (c) body-related motivation (appearance and fitness). The sample consisted of 376 adults (241 women, and 134 men, one subject sex was unknown). The male participants ranged in age from 20 to 70 years old and the female participants ranged in age from 18 to 75 years old. Results demonstrate that for the individual sport participants group, interest and enjoyment and competence motives were greater than the fitness group participants. It was found that the fitness group participants scored higher on body-related motives. Correlations demonstrated all types of motivation to be related to participation; however only interest and enjoyment and competence motivation influenced positive psychological outcomes. Body-related motivation was associated with greater depression and anxiety, with the exception of self-esteem.

The next section presents a review of theoretical perspectives on motivation in the physical activity domain; while the review is not exhaustive, it does highlight self-determination theory and key constructs that can facilitate understanding of adolescents' motivation for and participation in physical activity.

### **Self-Determination Theory**

Motivation is a fundamental component of numerous socio-psychological theories that seek to explain human behaviour. Self-determination theory seeks to explain human motivation and personality by way of understanding individuals' behavioural self-regulation (Ryan, Kuhl, & Deci, 1997). According to Deci and Ryan (2000), self-determination theory is

based on the assumption that people are naturally inclined to integrate their ongoing experiences and encompasses three psychological needs: (a) the need for competence, (b) the need for autonomy, and (c) the need for relatedness. The need for competence refers to the belief that one is capable of producing a desired outcome; the need for autonomy is one's ability to choose the behaviour or activity in which to engage (i.e., the quality of behaviour); and the need for relatedness refers to the quality of one's relationships with (i.e., of feeling understood by) others. Negative external events that influence an individual's competence, autonomy, and relatedness will likely decrease levels of intrinsic motivation. According to Deci and Ryan, self-determination theory proposes that individuals' perceived autonomy (i.e., the quality of their behaviour) is part of a continuum linking types of motivation (i.e., amotivation, extrinsic, and intrinsic) with types of regulation as illustrated in Figure 1.



*Figure 1.* Self-determination continuum.\*

\*Adapted from Müller and Louw (2003).

### **Types of Regulation**

The self-determination continuum comprises four types of regulation (or motivators) corresponding to extrinsic motivation—and to increasing degrees of autonomy, leading to intrinsic motivation—as follows: (a) external regulation, (b) introjected regulation, (c) identified

regulation, and (d) integrated regulation. The types of motivation are presented below from the lowest to the highest level of self-determination. The behaviours initiated from a more intrinsic type of motivation (e.g., personal choice) are often more self-determined and, in turn, lead to more positive motivation (Standage, Duda, & Ntoumanis, 2003).

**External regulation.** Refers to individuals motivated only by external contingencies—that is, reward or punishment. It is the furthest removed from intrinsic motivation. Regardless of whether the goal of behaviour is to obtain rewards or to avoid sanctions, the individual experiences an obligation to behave in a specific way, and feels controlled by the reward or by the constraint (Deci & Ryan, 1985; Vallerand & Bissonnette, 1992). For example, students may participate in an activity due to feeling pressured to do so by their teacher.

**Introjected regulation.** The source of control is inside the individual, internal control. However, while internal to the person, this form of internalization is not truly self-determined since it is limited to the internalization of external contingencies (Vallerand & Bissonnette, 1992). The individual is responsible for rewards or constraints, not others. His/her internalized reasons for participation are tied to internal rewards and punishment—for example, because I want the teacher to think I am a good student.

**Identified regulation.** Refers to the individual's identification with opportunities that are in accordance with the learners' own goals but are not intrinsically motivated. Participation is self-determined but the activity is not seen as fun. Behaviour is valued and chosen by the individual. Thus, the learner exhibits direction and purpose, rather than obligation and pressure, in performing the behaviour (Vallerand & Bissonnette 1992)—for example, because it is important to the learner.

**Integrated regulation.** Refers to the most internalized form of regulation. In relation to self-determination, integrated extrinsic motivation can hardly be distinguished from intrinsic motivation—for example, completing daily exercises because one realizes they are part of enhancing good health.

**Intrinsic regulation.** Intrinsic regulation implies that there is no regulation by extrinsic rewards; action is sustained from the pleasure derived from the activity itself (Müller & Louw, 2004; Vallerand & Bissonnette, 1992)—for example, because the learner enjoys doing homework. In terms of motivation, this is the optimal level to be reached (Vallerand & Bissonnette, 1992). The individual performs the behaviour willingly and self-regulation is consistent with the individual's self-concept. At this stage of integration the individual experiences the greatest level of self-determination for extrinsically motivated behaviours (Vallerand & Bissonnette, 1992). Students who perceive greater autonomy demonstrate better school behaviour, exhibit enhanced performance, and report more intrinsic motivation. (Levesque, Zuehlke, Stanek, & Ryan, 2004).

### **Amotivation**

Apart from intrinsic and extrinsic motivation, Deci and Ryan (1985) claim that a third construct—non-regulation (amotivation)—is important to fully understand human behaviour. Ryan and Deci (2000) define amotivation as the absence of any motivation in an individual. An amotivated person exhibits no extrinsic or intrinsic reasons for participating in physical activity. This type of motivation may have an influence on an individual's level of engagement in physical activity. Amotivated behaviours are neither driven by internal nor external motivation. Individuals are said to be amotivated when they perceive a lack of contingency between their behaviour and outcomes (Vallerand & Bissonnette, 1992, p.163).

There are no identified rewards (intrinsic or extrinsic), and therefore no perceived reason for participation. Thus, it can be said that amotivated behaviours are the least self-determined because there is no sense of purpose and no expectation of reward or change in the course of events (Vallerand & Bissonnette, 1992).

Motivation is the central block of the self-determination theory and provides an explanation for behaviour. Ntoumanis (2005) –established that students who reported high satisfaction of autonomy, competence, and relatedness in PE were more likely to participate in optional PE classes during the subsequent school year” (as cited in Ntoumanis & Standage, 2009, p. 7). These results demonstrated –direct, positive relations between autonomous motivation and well-internalized extrinsic motivation, and indirect, positive relations between psychological well-being, adaptive cognitive responses, behavioural persistence, and behavioural intentions” (Ntoumanis & Standage, 2009, p.7). Standage, Duda, and Ntoumanis (2005) indicated that perceptions of the need for satisfaction directly predict autonomous motivation and indirectly predict positive PE related outcomes. Cox et al. (2008) concluded that PE research has demonstrated greater perceptions of competence, autonomy, and relatedness is linked to self-determined motivation. Cox et al. and Ntoumanis (2001) found that recent PE studies have supported intervention models to increase effort and intention and decrease boredom through self-determined motivation. The current study examines female adolescents’ motivation to enrol or not enrol in PE class.

Understanding what motivates individuals to participate in PA may provide insight into effective ways to encourage individuals to continue to enrol in PE. Therefore, this study proposes to examine why female adolescents discontinue their enrolment in high school PE classes once it becomes an elective.

## **Intrinsic and Extrinsic Motivation**

Two forms of motivation, intrinsic and extrinsic, were assessed in this study. Voluntary participation in physical activity rests on intrinsic motivation (Wang, 2004). An intrinsically motivated person engages in physical activity due to the inherent pleasure of performing the activity. Intrinsic motivation can be associated with behaviours which lead to pleasure and satisfaction (Papacharisis & Goudas, 2003). Papacharisis and Goudas (2003) indicated that intrinsically motivated students showed better learning skills and expressed greater pleasure in attending classes in general; in contrast, extrinsic motivation is associated with behaviours directed toward achievement of a specific external reward. Extrinsic rewards that individuals view as encouragement for further participation will enhance intrinsic motivation.

Papacharisis and Goudas (2003) and Goudas and Biddle (1993) have agreed that the success of PE programs relies on the development of intrinsic motivation associated with exercise and participation in physical activities. According to Ryan and Deci's (2000) interpretation of self-determination theory, students with more self-determined motivation will demonstrate greater persistence, effort, and enjoyment than students with less self-determined motivation. In the physical education setting, more self-determined students report stronger intentions to participate in physical activity, are more likely to participate in optional PE in the future, and are more physically active during leisure time (Hagger, Chatzisarantis, Culvershouse, & Biddle, 2003; Ntoumanis, 2001, 2005; Standage et al., 2003). Consequently, Cox and Williams (2008) noted "promoting self-determined motivation in physical education may support the integration of physical activity behaviors acquired in physical education into future physical activity pursuits and daily living outside of school" (p. 223). The success of PE

is not only concerned with students' participation in the course but also with the continuation of physical activity after school.

Studies have shown that intrinsically motivated individuals show greater interest, enthusiasm, and self-confidence in activities or programs and thus tend to perform better and be more creative (Deci & Ryan, 1991; Papacharisis & Goudas, 2003). Frederick and Ryan (1993) investigated intrinsic versus extrinsic motivation to examine individual differences in initial motivation for involvement in physical activities. They identified that different types of physical activities may attract people with different forms of motivation. An emphasis on developing female adolescents' motivation with regards to participation in PE is a key element to encouraging enrolment in PE classes throughout high school.

### **Motivational Sequences**

The present study explores the effects of social factors (competition/cooperation) on persistence to continue in PE. Autonomy is an important concept of self-determination found within the motivational sequence, without which self-determination cannot be exhibited. Critical for conceptualizing the relationship between PE and physical activity behaviour is the premise that individuals in a setting who are more self-determined will transfer behaviours from that setting to other contexts (Cox et al., 2008; Ryan et al., 1997; Vallerand, 1997). Recent research suggests that such transfer is due to the positive consequences likely to result from more self-determined motivation (Cox et al., 2008, p. 223; Hagger et al., 2003; Hagger & Chatzisarantis, 2007; Shen, McCaughy, & Martin, 2007). Cox et al. (2008) suggested that affective (e.g., enjoyment) and behavioural (e.g., activity levels in physical education) variables also should mediate the relationship between self-determined motivation in PE and leisure-time physical activity. Vallerand's (1997) hierarchical model, derived from self-determination theory,

suggests that a variety of positive consequences of self-determined motivation within a specific context may explain related consequences outside of that context. Vallerand's hierarchical model of intrinsic and extrinsic motivation illustrates the motivational sequences that play a role in motivational outcomes. The effects of these four sequences are linked together, as illustrated in Figure 2.

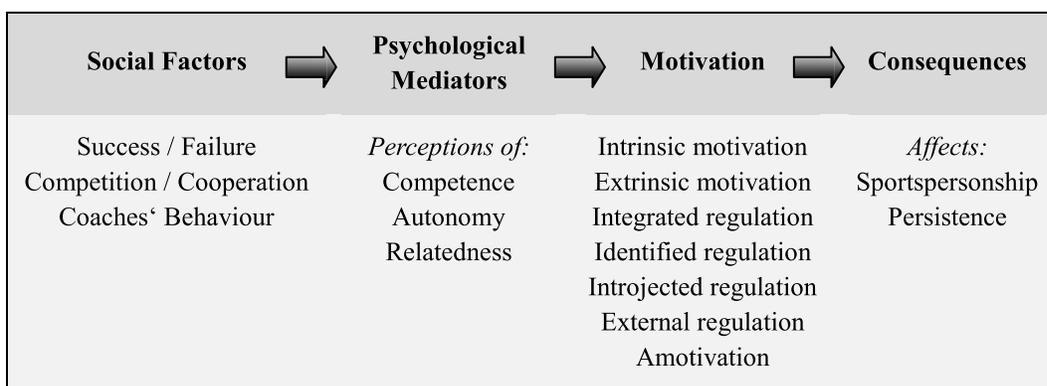


Figure 2. Motivational sequences.\*

\*Adapted from Vallerand (1997).

### Approaches to Understanding Motivation in Physical Activity

Standage, Duda, and Ntoumanis (2005) examined a model of motivation based on the SDT. The sample consisted of 950 British secondary school students (443 males, 490 females, 17 gender not specified). Participants completed a questionnaire that included measures of need support, need satisfaction, motivation, positive and negative affect, task challenge, and concentration. Standage et al. concluded that the need for satisfaction predicted intrinsic motivation. Standage et al.'s conclusion provides the necessary support for the SDT and its application to the context of PE.

Gillison, Osborn, Standage, and Skevington (2009) found that adolescent students, both boys and girls, with a mean age of 14 years, exhibited high levels of introjected regulation

relative to their peers in sport and/or exercise. Participants reported that enjoyment was one of the primary reasons they participate in sport and/or exercise. They found that perceived importance of exercise was exhibited by identified regulation and that introjected regulation played a role in participants' feelings of obligation towards staying involved in sporting activities. It was stated that these findings indicate the importance of assessing an individual's motives towards participating in sport and/or exercise. The conclusions made by Gillison et al.'s studies provides support for the current study that aims to discover why female adolescents discontinue their participating in PE and to determine what could be done to encourage their ongoing enrolment in PE classes.

Wilson, Rogers, Fraser, and Murray (2004) applied the BREQ-2 to examine beliefs from the SDT that contend motivational consequences vary as a function of different regulations in the exercise domain. From the 276 participants ( $n_1 = 98$ ;  $n_2 = 178$  women) results demonstrated that autonomous exercise regulators (identified and intrinsic) were the strongest correlates of each motivational consequence across both sexes, and introjected regulation was positively associated with women. Results also indicated that exercise regulators accounted for a sizeable portion of the variance across each motivational consequence in both sexes. Results demonstrated that introjected regulation was a stronger motivational force in women than in men, and identified regulation was the most important factor of all three motivational consequences in both sexes. Wilson et al. concluded that exercise regulations differentially predict motivational consequences across sexes. It should be noted that unlike the present study that applied the four extrinsic regulators, Wilson et al. only included three extrinsic regulators, omitting integrated regulation.

In summary, SDT provides a meaningful analysis to explain the degree to which an individual's behaviour is self-motivated and self-determined (Deci & Ryan, 2002). The

literature indicates that SDT aims to examine individuals' motivation behind their choices without any interference and external influence. The review of literature demonstrates that previous studies applied SDT to analyze drop outs by looking at previous studies of self-determined motivation and how they affect PE participation, including dropping out of or participating in optional PE programs. The studies emphasized in the current review of literature provide a foundation upon which the current study attempted to expand on specifically; to how one's motivation for PE may influence patterns of PA participation.

In the next section, the type of environment created in PE class and how student's perceptions of their PE class have been examined in the PA domain will be reviewed.

### **Mastery Versus Performance Motivational Climates**

Researchers in PE have emphasized the importance of the social context via mastery and performance motivational climates (Ames, 1992; Goudas & Biddle, 1994). Mastery climates are characterized as environments in which students perceive they are rewarded for personal improvement and learning, whereas performance climates are those in which students perceive that superior performances are rewarded. It is possible for students to perceive an environment in which they are rewarded for both (Ferrer-Caja & Weiss, 2000; Standage et al., 2003). Mastery climates are thought to promote feelings of competence, autonomy, and relatedness, and thus support self-determined motivation (Ames, 1992). According to Ames (1992), a mastery climate is fostered by the teacher's focus on learning, self-improvement, and effort as keys to success. In contrast, performance climates are thought to provide fewer opportunities to feel competent and autonomous and thus undermine self-determined motivation. According to Ames, a performance climate is promoted by the teacher's emphasis on competition, winning, and outperforming others. Goudas et al. (1994) suggest perceptions of a mastery climate positively predict levels of

self-determined motivation, while perceptions of a performance climate negatively relate to intrinsic motivation and positively relate to both amotivation and levels of extrinsic motivation. Escarti and Gutiérrez (2001) and Ntoumanis and Biddle (1999) reviewed the influence of the motivational climate created in PE class and concluded that students who perceived a climate with a performance orientation appeared less intrinsically motivated.

### **Physical Education and Motivational Climate**

Researchers in PE continue to identify the influence of the motivational climate related to students' participation. Goudas and Biddle (1994) believe research regarding motivational issues is crucial to deter female adolescents from dropping out of PE programs. Goudas and Biddle assessed adolescent students, PE class climate, and the relationship of subscales of the inventory with intrinsic motivation. It was found that the mastery dimension scores significantly enhanced the prediction of intrinsic motivation beyond that accounted for by perceived competence, whereas that was not the case for performance climate scores. The results of the MANOVA demonstrated that children perceiving their PE class to be high in both mastery and performance climate reported greater intrinsic motivation and perceived competence. Results demonstrated that the mastery dimension significantly enhanced the prediction of intrinsic motivation for the group. Similarly, Escarti and Gutiérrez (2001) and Ntoumanis and Biddle (1999) reviewed the influence of motivational climate created in PE class and concluded that students who perceived their PE climate as having a class mastery orientation concurrently demonstrated high levels of intrinsic motivation.

Gutiérrez and Ruiz (2009) investigated students' perceptions of motivational climate, sportsmanship attitudes, and attitudes toward PE teachers and course content. The participants consisted of 2,189 secondary students aged 13 to 17 years (1,106 were boys and 1,083 girls) in a

total of 43 schools in Spain. Gutiérrez and Ruiz hypothesized that pupils' perception of the motivational climates would determine the perception of teachers' strategies to sustain discipline, which would influence intrinsic motivation in PE. Results demonstrated that the motivational climate factor Pursuit of progress by pupils presented a positive relation to perceived teachers' emphasis on intrinsic reasons to maintain discipline, and negative relation to teachers' disregard to maintain discipline. Promotion of learning by the teacher positively predicted teachers' emphasis on intrinsic reasons, and negatively predicted teachers' emphasis on introjected reasons and disregard to maintain discipline. Pursuit of comparison by pupils presented a positive relation to teachers' emphasis on introjected reasons and teachers' disregard to maintain discipline in class. It was demonstrated that Worries about mistakes indicated a significant positive relation with teachers' emphasis on introjected reasons and teachers' disregard to maintain discipline. As well, Promotion of comparison by the teacher predicted teachers' emphasis on introjected reasons and teachers' disregard to maintain discipline in PE classes. Gutierrez and Ruiz found that perceived mastery climate is a predictor of students' attitudes toward PE content, teachers, and positive sportsmanship. They concluded that the results demonstrate the need to determine which learning climates are developed in PE lesson and the perceptions that students have about such climates.

Other reasons can be attributed to this occurrence of drop out within this particular age group. Coelho e Silva, Gonçalves, and Garcia Silva (n.d.) suggested that personal and environmental factors play a role on whether females participate. Several studies have indicated that a narrow curriculum, where competitive team games are emphasized, fails to address the needs and interests of the whole school population, and does not transfer well to out-of-school

participation. Coelho e Silva et al. stated that girls often are discouraged from an overly competitive teaching climate and prefer individual, co-operative activities.

Research has supported that levels of intrinsic motivation and mastery orientation created in PE classes might positively influence female adolescents to stay enrolled in PE throughout high school (Escarti & Gutiérrez, 2001; Ntoumanis & Biddle, 1999). Together, researchers suggest that the motivational climate influences the students' motivation. Studies in PE show that the perceived motivational climate to which students are exposed influences the type of motivation that the students display. Further, emphasizing the role that motivational climate plays related to PE physical, and how it is critical to investigate why female adolescents are choosing to drop out of PE in high school once it becomes an elective.

### **Approaches to Measuring Motivational Climate**

Motivation studies have set the foundation to analyze the impact of motivational climate on numerous motivational variables. Ntoumanis and Biddle (1999) performed a critical review of research on the motivational impact of different psychological climates in physical activity. Ntoumanis and Biddle found that motivational, cognitive, affective, and behavioural outcomes are considered in exercise, sport, and school physical education. They reviewed studies influenced by the work of Ames in classroom settings as well as included questionnaires to measure individuals' perceptions of "motivational climates." Ntoumanis and Biddle concluded that "a mastery motivational climate is associated with more adaptive motivational patterns, while a performance climate is linked with less adaptive or maladaptive motivational and affective responses" (p. 643).

Birnbaum et al.'s (2005) objective was to test an original scale assessing perceived school climate for girls' physical activity in middle school girls. The purpose of the study was to assess

the perceived school climate for girls' physical activity in a sample of sixth- and eighth-grade girls. Birnbaum et al. concluded that girls' "perceived school climate" regarding physical activity is related to their physical activity participation both within and outside of PE classes. They concluded that the influence of the teacher factor, and not the boy factor, was found to have a significant association with self-reported participation levels of physical activity in both sixth- and eighth-grade girls. This study suggests further research should be completed to explore how school climate and girls' physical activity are related.

Escarti and Gutiérrez (2001) applied the PECCS to study the influence of the motivational climate in PE class on the intention to practice physical activity or sport. The study was based on the achievement goal theory and intended to verify the effects of the motivational climate of the PE class on students' motivation, interest, and intention to practice physical activity or sport. The study consisted of 975 participants, ages 13 to 18 years, who completed the following instruments: PECCS, TEOSQ, IMI, Satisfaction Scale, and the Intention to Practice Physical Activity or Sport. The results confirmed that the mastery dimension of motivational climate has an influence, directly or indirectly, on task orientation, the three dimensions of intrinsic motivation—interest, perceived competence, and satisfaction—and the intention to practice physical activity or sport, in contrast to ego orientation. On the other hand, the comparison dimension of the motivational climate demonstrated specific effects on each of the variables analyzed, increasing the tension-pressure and negatively affecting the enjoyment and interest of the students. Therefore, in PE, a motivational climate oriented more toward mastery, rather than a competitive climate, should be promoted.

In summary, the motivational climate is in large part influenced by how the teacher portrays the class climate and the student's perception of the environment. The literature

suggests that perceptions of high performance climate may not be motivationally detrimental, as long as they are accompanied by perceptions of high mastery climate. The studies emphasized in the current review of literature provide a foundation, upon which the current study attempted to expand on specifically, perceptions of a mastery climate are important in increasing and sustaining the motivation of students in physical education settings. In particular, the literature demonstrated that perceptions of a mastery climate were found to relate to high intrinsic interest and positive attitudes towards lessons. In contrast, perceptions of a performance climate are unrelated or negatively related to these cognitive and behavioural factors.

## Chapter Three: Methodology

### Demographics

The sample consisted of 239 female adolescents aged 14 to 17 (60.3% were 15 years old). Participants from grades 9 and 10 were recruited from three high schools located in Thunder Bay, Ontario. Initially, the participants were categorized into one of four groups based on their grade and intentions. The four groups included: grade 9 enrolled and planning to enrol next year; grade 9 enrolled who did not plan on enrolling in physical education class in the next year; grade 10 enrolled; and grade 10 not currently enrolled in physical education class. After analysis, it was found that there was no significant difference found between grades. Therefore, the four groups were collapsed into two groups. The between effects of those enrolled (or intending to enrol) and those non-enrolled (or not intending to enrol) were analyzed. Thirty-nine participants were undecided with regard to whether or not they planned on enrolling in physical education class; therefore, they could not be classified into one of the four groups. As a result, 200 female adolescent students ( $n_1 = 115$  enrolled and  $n_2 = 85$  non-enrolled) were included in the final analysis.

### Data Collection

A research ethics application was approved by Lakehead University and the Lakehead Public School board to gain permission to contact the designated high schools. The Physical Education department heads at each high school were contacted to request permission for participation of the designated grade 9 and grade 10 physical education teachers and students. Prior to administration of the questionnaire package the researcher arranged an initial meeting with the teachers and students to introduce the research objectives and to distribute recruitment (Appendix A) and consent forms (Appendix B) to those who expressed an interest. The

researcher returned one week later to administer the questionnaire packages to all participants who had parent/guardian permission. The questionnaire package contained the Demographic Questionnaire, Physical Activity Questionnaire for Older Children (PAQ-C), Behavioral Regulation in Exercise Questionnaire-2 (BREQ-2), Motives for Physical Activity Measure-Revised (MPAM-R), Physical Education Class Climate Scale (PECCS).

All questionnaire packages were distributed to the participants in the school gymnasium and/or in a designated classroom. All participants were instructed to complete the questionnaire package with no communication with fellow classmates. It took the participants approximately 20 minutes to complete the questionnaire package. The participants were asked to hand the completed questionnaire to the researcher and the questionnaire packages were placed in a sealed envelope and then placed in a collection box to ensure confidentiality. In accordance to ethics policies, the instructions also stated that participation was completely voluntary and that responses would be kept strictly confidential and anonymous. Participants were free to withdraw at any time without having to provide any explanation. No personal information such as names or addresses was collected.

### **Instrumentation**

A Demographic Questionnaire (Appendix C) was developed to gather background information about the participant's perception of physical activity and physical education class. One question was measured on a 5-point Likert scale. Several other open-ended questions were also included to offer participants the opportunity to provide feedback on the physical education class experience.

The PAQ-C questionnaire (self-report measure) was used for demographic purposes to assess the physical activity levels of the female adolescents over the past 7 days prior to the

survey. Crocker et al. (1997) believe the PAQ-C is a valid tool for assessing physical activity at various ages and provides a general measure of physical activity for youth (Appendix D).

The BREQ-2 questionnaire (Markland & Tobin, 2004) measures self-determined motivation towards physical exercise behaviours. The BREQ-2 uses a 5-point Likert scale and consists of 19 items. The BREQ-2 coincides with the self-determination continuum that measures external regulation, introjected regulation, identified regulation, and intrinsic motivation. Cronbach alphas of the BREQ-2 subscales have been shown to range between .75 and .89 (Moreno, Cervelló, & Martinez, 2007; Wilson & Rodgers, 2004). Wilson et al. (2004) applied the BREQ-2 to examine beliefs from the SDT that contend motivational consequences vary as a function of different regulations in the exercise domain. For the purpose of the present study the BREQ-2 instrument was applied to assess the levels of motivation towards physical activity in young female adolescents (Appendix E).

The MPAM-R (Ryan et al., 1997) measures a participant's motives for engaging in physical activity. The MPAM-R uses a 7-point Likert scale and consists of 30 items that assess five motives for participating in sport and exercise. Interest and enjoyment, and competence are motives that reflect intrinsic motivation while appearance, fitness, and social motivations represent extrinsic motivation. Ryan et al. (1997) reported adequate reliability Cronbach alpha levels ranging from .78 to .92. For the purpose of the present study the MPAM-R was applied to assess behavioural outcomes in relation to intrinsic and extrinsic motives related to physical activity and physical education class (Appendix F).

The PECCS questionnaire (Goudas & Biddle, 1994) measures the influence of teachers and peers on motivational class climate. The PECCS uses a 5-point Likert scale and consists of 19 items organized into five subscales: pursuit of progress by pupils (mastery), promotion of

learning by teacher (mastery), promotion of comparison by teacher (performance), promotion of comparison by pupils (performance), and worries about mistakes (performance). Biddle et al. (1995) reported Cronbach alpha levels ranging from .64 to .84. The PECCS was used in the present study to assess perceived physical education motivational class climate of the participants (Appendix G).

## Chapter Four: Results

### Data Entry and Analysis

Following the data collection, participants were categorized into one of four groups based on their grade and intentions. The four groups included: grade 9 enrolled and planning to enrol in physical education class next year; grade 9 enrolled who did not plan on enrolling in physical education class in the next year; grade 10 enrolled in physical education class; and grade 10 not currently enrolled in physical education class. The t-test and analysis of variance (ANOVA) are widely used statistical methods to compare group means. A 2 x 2 ANOVA using SPSS (version 16.0) was used to investigate the between group differences and assess the individual and combined effects of two or more independent variables within a single dependent variable (Diekhoff, 1996). It was found that there was no significant difference found between grades. Therefore, the four groups were collapsed into two groups, enrolled and non-enrolled. The total number of participants was 200 with the enrolled group consisting of  $n=115$  participants and the non-enrolled group consisting of  $n=85$  participants.

To determine whether the dependent variables were normally distributed, homogeneity of variances between groups was assessed by using the Levene's Test for Equality of Error Variances. An independent sample *t*-test (equal or unequal variances assumed) was performed to assess whether there was a statistically significant difference between the enrolled and non-enrolled female adolescents groups with respect to regulators, motives, and subscales. A Bonferroni correction (multiple-comparison correction) was used because of the multiple testing in the present study. A Bonferroni correction is applied to adjust the significance level and avoid the problems of the inflation of the significance level. In the present study, the Bonferroni correction is calculated by dividing the alpha level by the number of comparisons ( $0.05/2=0.025$ )

and rejecting the null hypothesis if  $p \leq 0.05$  to the corrected significance level. It has been suggested that it does a good job of protecting statistics from Type I errors (false positive); it however makes you a little more vulnerable to Type II errors (false negative). For any given set of data, Type I and Type II errors are inversely related. Again, this is yet another reason that this study needs to be replicated.

### **Reliability Analyses**

Reliability is the degree to which differences in observed scores are consistent with differences in true scores (Furr & Bacharach, 2008). The reliability of scores obtained depends on two factors: (a) the extent to which differences in test scores might be attributed to real inter- or intraindividual differences, and (b) the extent to which such differences are a function of measurement error (Furr & Bacharach, 2008). Previously BREQ-2 subscales have ranged between 0.75 and 0.89 (Moreno et al., 2007; Wilson & Rodgers, 2004); MPAM-R subscales alpha ranged from .82 and .92 (Reed & Cox, 2007); and Biddle et al. (1995) reported Cronbach alpha levels for the PECCS ranging from 0.64 to 0.84 (see Table 1).

### **Reliability Analysis of Instrumentation**

For the current investigation, internal consistency estimates (Cronbach alphas) were computed for all variables within the questionnaires BREQ-2, MPAM-R, and the PECCS. The standardized alpha provides information on how each item reflects the reliability of the scale. In the case of the BREQ-2 questionnaire, the coefficient for the overall scale was low at 0.52. For the subscales, the observed internal consistency coefficients were low ranging from 0.25 to 0.64, and the internal consistency coefficients for the subscales introjected regulation ( $\alpha=0.25$ ) and identified regulation ( $\alpha=0.27$ ) were weak.

Table 1

*Reliability Analyses*

Variable	Range	$\alpha$	Scale M	Scale variance	SD	Scale Cronbach's alpha
<b>BREQ-2</b>						
Amotivation	1-5	.64	8.11	7.38	2.71	.522
External	1-5	.49				
Introjected regulation	1-5	.25				
Identified regulation	1-5	.27				
Intrinsic	1-5	.48				
<b>MPAM-R</b>						
Interest & Enjoyment	1-7	.71	24.83	28.46	5.33	.803
Competence	1-7	.71				
Appearance	1-7	.87				
Fitness	1-7	.74				
Social	1-7	.74				
<b>PECCS</b>						
Pursuit of Progress by Pupils	1-5	.65	15.89	9.67	3.10	.695
Promotion of Learning by Teachers	1-5	.70				
Promotion of Comparison by Teacher	1-5	.66				
Promotion of Comparison by Pupils	1-5	.58				
Worries about Mistakes	1-5	.60				

Furr and Bacharach (2008) reported the variance of the sum of two items is equal to the sum of the two variances minus (two times) the covariance (i.e., the amount of true score variance common to the two items). They suggest that the variance of the sum will be the same as the sum of variances of the individual items if there is no true score but only error in the items. If all items are perfectly reliable and measure the true score, then coefficient alpha is equal to 1. For example, the reliability implications of low alpha scores on the BREQ-2 demonstrates that the introjected regulation ( $\alpha=0.25$ ) observed score variance is comprised of 0.25 true score and 0.75 error variance. Similarly, the low alpha score for identified regulation ( $\alpha=0.27$ ) comprises 0.27 true score and 0.73 error variance. This indicates that respondents' scores displayed measurement error of 75% and 73%, respectively. The scores affect the overall reliability of the BREQ-2 which demonstrates relatively low reliability due to high error variance in comparison to the observed score variance. Not all subscales within the BREQ-2 scale are reliable, in this case the low levels of introjected and identified alpha scores. The identified poor reliability might also suggest individual subscales within the tool scale should be re-examined or modified as needed.

In the case of the MPAM-R questionnaire, the observed internal consistency coefficients for the overall scale and subscales were above 0.70. For the PECCS questionnaire, the observed internal consistency for the overall scale was 0.70, and subscales ranged from 0.58 to 0.70 indicating levels at or slightly below the 0.70 criterion level. The PECCS alpha scores indicate respondents' scores are affected only slightly by measurement error. Thus, reliability is relatively high when error variance is small in comparison to observed score variance (Furr & Bacharach, 2008). The homogeneity of variances between groups was assessed by using the Levene's Test for Equality of Error Variances (Table 2).

Table 2

*Levene's Test for Equality of Error Variances*

Variable	Range	<i>t</i>	F	Sig. (2-tailed)
<b>BREQ-2</b>				
Amotivation	1-5	1.903 $\Delta$	5.672	.018*
External	1-5	.950	.015	.903
Introjected regulation	1-5	-.442	.348	.556
Identified regulation	1-5	-3.367	5.042	.026*
Intrinsic	1-5	-2.983	2.894	.090
<b>MPAM-R</b>				
Interest & Enjoyment	1-7	-3.758 $\Delta$	4.023	.046*
Competence	1-7	-3.934 $\Delta$	11.857	.001***
Appearance	1-7	.434	.108	.742
Fitness	1-7	-3.936 $\Delta$	20.879	.000***
Social	1-7	-2.310 $\Delta$	2.838	.094
<b>PECCS</b>				
Pursuit of Progress by Pupils	1-5	-3.279	3.109	.079
Promotion of Learning by Teachers	1-5	-2.631 $\Delta$	4.954	.027*
Promotion of Comparison by Teacher	1-5	.690	.227	.634
Promotion of Comparison by Pupils	1-5	1.175	6.252	.013**
Worries about Mistakes	1-5	1.069	1.161	.283

*Note.* df=198; two-tailed; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ,  $\Delta$ =equal variances not assumed.

## Results

**Demographics.** The PAQ-C questionnaire (self-report measure) was used for demographic purposes to assess participants' physical activity levels over the 7 days prior to the survey. The PAQ-C information gathered was used for background information about the participants' activity levels, to see if there was a significant difference between the enrolled and non-enrolled female adolescents with respect to PA levels prior to questionnaire administration. Researchers suggest that various levels of physical activity participation are associated with health benefits and/or health risks (Welk & Wood, 2000). To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to "how often you were very active in PE class" ( $F(1,198)= 24.73, p=.000$ ) and "what did you normally do at lunch" ( $F(1,198)= 4.958, p=.027$ ), an independent sample  $t$ -test (equal variances not assumed) was performed. The result of the independent  $t$ -test for the former question ( $t_{(200)} = -6.931, p=.000$ ) indicated significant differences between enrolled and non-enrolled female adolescents with enrolled students exhibiting higher mean scores. In contrast, it was found that for the latter question ( $t_{(200)} = -1.363, p=.175$ ), the scores were not significantly different between enrolled and non-enrolled female adolescents. To assess differences between the enrolled and non-enrolled female adolescents with respect to questions 4 to 8, an independent sample  $t$ -test (equal variances assumed) was performed. The results of the independent  $t$ -tests for questions 4 to 8 all indicated significant differences between enrolled and non-enrolled female adolescents. Again, mean scores were higher for enrolled students compared to non-enrolled students. Question 1, "Mean of all activities" was calculated by taking the mean of all activities (1="no" activity to 5="7 times or more") on the activity checklist to form a composite score. There were no significant differences between groups based on this score (see Table 3).

Table 3

*PAQ-C Scores*

Question	Status	N	Mean	Std. Deviation	T	Sig. (2-tailed)
1. Mean of all Activities	Non Enrolled	85	1.39	.319	-2.260	.516
	Enrolled	115	1.50	.346		
2. How often were you very active in PE class?	Non Enrolled	85	2.95	1.371	-6.931 Δ	.000***
	Enrolled	115	4.11	.825		
3. What did you normally do at lunch?	Non Enrolled	85	1.68	.727	-1.363 Δ	.175
	Enrolled	115	1.82	.643		
4. How many days right after school, did you do sports, dance, or play games in which you were very active?	Non Enrolled	85	2.46	1.41	-2.957	.003**
	Enrolled	115	3.03	1.28		
5. How many evenings right after school, did you do sports, dance, or play games in which you were very active?	Non Enrolled	85	2.54	1.22	-3.130	.002**
	Enrolled	115	3.09	1.21		
6. How many times did you do sports, dance, or play games in which you were very active?	Non Enrolled	85	2.47	1.20	-2.781	.006**
	Enrolled	115	2.93	1.12		
7. Best describe the last 7 days	Non Enrolled	85	2.55	1.06	-3.830	.000***
	Enrolled	115	2.93	1.12		
8. Mean of how often physically active each day last week	Non Enrolled	85	2.50	.884	-5.165	.000***
	Enrolled	115	3.17	.928		

Note. df=198; two-tailed; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , Δ=equal variances not assumed.

**Levels of motivation and enrolment in physical education class.** The BREQ-2 (Markland & Tobin, 2004) measures self-determined motivation toward physical exercise behaviours. The BREQ-2 was used to assess the levels of motivation towards physical activity behaviours between groups using a 5-point Likert scale (0=*not true for me* and 4=*very true for me*). By applying the BREQ-2 questionnaire, it was discovered that the enrolled female adolescent students would demonstrate behaviours that indicate greater intrinsic motivation based on the behavioural regulation continuum towards physical education class. The mean scores and standard deviations for each regulator are presented in Table 4.

Table 4

*BREQ-2 Regulator Scores*

Regulator	Status	N	Mean	Std. Deviation	T	Sig. (2-tailed)
Amotivation	Non Enrolled	85	0.39	0.60	1.844	.067
	Enrolled	115	0.25	0.48	Δ	
External	Non Enrolled	85	0.93	0.86	0.950	0.343
	Enrolled	115	0.81	0.84		
Introjected	Non Enrolled	85	1.59	1.14	-0.442	0.659
	Enrolled	115	1.66	1.20		
Identified	Non Enrolled	85	2.40	0.97	-3.284	0.001***
	Enrolled	115	2.83	0.82	Δ	
Intrinsic	Non Enrolled	85	2.39	1.08	-2.983	0.003**
	Enrolled	115	2.82	0.94		

*Note.* df=198; two-tailed; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , Δ=equal variances not assumed.

To test for homogeneity of variances between the enrolled and non-enrolled female adolescents with respect to motivation towards physical education class, a Levene's test for equality of variances was performed. The results of this test indicated non-significant values at the .05 level for the external, introjected, and intrinsic subscales, therefore equality of variances was assumed. Significant differences were observed for the subscales of amotivation ( $F(1,198)=5.672, p=.018$ ) and identified ( $F(1,198)=5.042, p=.026$ ), indicating that the regulators did not meet the parametric assumption of equality of variance (see Table 4).

To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to external, introjected, and intrinsic regulators, an independent sample  $t$ -test (equal variances assumed) was performed. The results of the  $t$ -tests for the external regulators ( $t_{(198)}=.950, p=.343$ ) and introjected ( $t_{(198)}=-.442, p=.659$ ) were statistically non-significant. In contrast, the results of the independent  $t$ -test for the intrinsic regulator ( $t_{(198)}=-2.983, p=0.003$ ) was significant. The enrolled student means exhibited higher levels of intrinsic regulation than non-enrolled students. To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to amotivation and identified regulators, an independent sample  $t$ -test (equal variances not assumed) was performed. The results of the independent  $t$ -test for amotivation ( $t_{(198)}=1.844, p=.067$ ) were statistically non-significant. In contrast, the result of the independent sample  $t$ -test for the identified regulator ( $t_{(198)}=-3.367, p=0.001$ ) was statistically significant. The enrolled student means were higher than non-enrolled students in respect to identified regulation.

The Motives for Physical Activity Measure-Revised (MPAM-R) assessed five motives for engaging in physical activity: interest and enjoyment, competence, appearance, fitness, and social motives on a 7-point Likert scale (1= *not at all true for me* and 7= *very true for me*).

Interest and enjoyment, and competence are motives that reflect intrinsic motivation while appearance, fitness, and social motives represent extrinsic motivation. By applying the MPAM-R questionnaire, it was discovered that the enrolled female adolescent students would demonstrate motives that indicate greater intrinsic motivation towards participating in physical education class. The mean scores and standard deviations for each motive were analyzed and are illustrated in Table 5.

Table 5

*MPAM-R Scores*

Regulator	Status	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Interest & Enjoyment (Intrinsic Motive)	Non Enrolled	85	4.49	1.60	-3.669 Δ	0.000***
	Enrolled	115	5.28	1.36		
Competence (Intrinsic Motive)	Non Enrolled	85	4.40	1.74	-3.783 Δ	0.000***
	Enrolled	115	5.26	1.34		
Appearance (Extrinsic Motive)	Non Enrolled	85	5.14	1.53	0.434	0.665
	Enrolled	115	5.05	1.45		
Fitness (Extrinsic Motive)	Non Enrolled	85	5.38	1.34	-3.678 Δ	0.000***
	Enrolled	115	5.98	0.82		
Social (Extrinsic Motive)	Non Enrolled	85	3.89	1.44	2.31 Δ	0.022*
	Enrolled	115	4.34	1.30		

*Note.* df=198; two-tailed; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , Δ=equal variances not assumed.

To test for homogeneity of variances between the enrolled and non-enrolled female adolescents with respect to motivation towards physical education class, a Levene's test for

equality of variances was performed. The results of this test indicated non-significant values at the .05 level for the appearance motive; therefore, equality of variances was assumed.

Significant differences were observed for the subscales of interest and enjoyment ( $F(1,198) = 4.023, p=.046$ ); competence ( $F(1,198) = 11.857, p=.001$ ); fitness ( $F(1,198) = 20.879, p=.000$ ); and social ( $F(1,198) = -2.310, p=0.022$ ) indicating that these motives did not meet the parametric assumption of equality of variance (see Table 5).

To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to the appearance motive, an independent sample  $t$ -test (equal variances assumed) was performed. The result of the  $t$ -test for the appearance motive ( $t_{(198)} = .434, p=.665$ ) was statistically non-significant. To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to interest and enjoyment, competence, fitness, and social motives an independent sample  $t$ -test (equal variances not assumed) was performed. The results of the independent  $t$ -test on interest and enjoyment ( $t_{(198)} = -3.669, p=0.00$ ), competence ( $t_{(198)} = -3.783, p=0.00$ ), fitness ( $t_{(198)} = -3.678, p=0.00$ ) and social ( $t_{(198)} = -2.310, p=0.022$ ) motives were all statistically significant. For these four motives, the enrolled student means were higher than non-enrolled students.

**Motivational climate.** The Physical Education Class Climate Scale (PECCS) is a 19-item questionnaire organized into five subscales scored along a 5-point Likert scale (1= *not at all* and 5= *very much so*). The PECCS was used to assess perceived physical education motivational class climate of young female adolescent high school students. Pursuit of progress by pupils and promotion of learning by teachers are reflective of class mastery orientation characteristics while promotion of comparison by teacher, promotion of comparison by pupils, and worries about mistakes represent class performance orientation subscales. The motivational class climate is

reflected in how the physical education class is structured and the manner in which people are judged. By applying the PECCS questionnaire, it was discovered that the enrolled female adolescent students would perceive the class learning climate as having a class mastery orientation. The mean scores and standard deviations for each motive were analyzed and are illustrated in Table 6.

Table 6

*PECCS Scores*

Regulator	Status	N	Mean	Std. Deviation	T	Sig. (2-tailed)
Pursuit of Progress by Pupils (mastery)	Non Enrolled	85	3.13	0.945	-3.279	0.001***
	Enrolled	115	3.53	0.797		
Promotion of Learning by Teachers (mastery)	Non Enrolled	85	4.09	0.927	-2.531 Δ	0.012**
	Enrolled	115	4.40	0.712		
Promotion of Comparison by Teacher (performance)	Non Enrolled	85	2.44	0.943	.690	.491
	Enrolled	115	2.35	0.878		
Promotion of Comparison by Pupils (performance)	Non Enrolled	85	3.36	1.07	1.175	0.242
	Enrolled	115	3.20	0.872		
Worries about Mistakes (performance)	Non Enrolled	85	2.68	1.08	1.069	0.287
	Enrolled	115	2.52	1.00		

*Note.* df=198; two-tailed; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , Δ=equal variances not assumed.

To test for homogeneity of variances between the enrolled and non-enrolled female adolescents with respect to perceived motivation towards physical education class, a Levene's test for equality of variances was performed. The results of this test indicated non-significant results at the .05 level for the subscales, pursuit of progress by pupils, promotion of comparison by teacher, promotion of comparison by pupils, and worries about mistakes; therefore, equality of variances was assumed. Significant differences were observed for the subscale of promotion of learning by teachers ( $F(1,198) = 4.954, p=.027$ ) indicating that the regulator did not meet the parametric assumption of equality of variance (see Table 6).

To assess whether significant differences existed between the enrolled and non-enrolled female adolescents with respect to pursuit of progress by students, promotion of comparison by teacher, promotion of comparison by pupils, and worries about mistakes subscales, an independent sample *t*-test (equal variances assumed) was performed. The results of the *t*-tests for the promotion of comparison by teacher ( $t_{(198)} = .690, p=.491$ ), promotion of comparison by pupils ( $t_{(198)} = 1.175, p=.242$ ), and worries about mistakes ( $t_{(198)} = 1.069, p=.287$ ) subscales scores were statistically non-significant. In contrast, the results of the independent *t*-test for pursuit of progress by pupils ( $t_{(198)} = -3.279, p=.001$ ) was significant. The means for enrolled students on pursuit of progress by pupils were significantly higher than non-enrolled students. To assess if there were significant differences between the enrolled and non-enrolled female adolescents with respect to the promotion of learning by teachers subscale an independent sample *t*-test (equal variances not assumed) was performed. The results of the independent *t*-test on promotion of learning by teachers ( $t_{(198)} = -2.531, p=.012$ ) was statistically significant. The means for enrolled students on promotion of learning by teachers were significantly higher than non-enrolled students.

## Chapter Five: Discussion

### Physical Activity Participation Levels in Female Adolescents

The PAQ-C was used in the current study for demographic purposes to assess the physical activity levels of the female adolescents during the 7 days prior to the data collection. Those enrolled scored higher on questions: (2) *How often were you very active in PE class*; (4) *How many days right after school, did you do sports, dance, or play games in which you were very active*; (5) *How many evening right after school, did you do sports, dance, or play games in which you were very active?*; (6) *How many times did you do sports, dance, or play games in which you were very active?*; (7) *Best describe the last 7 days*; and (8) *Mean of how often physically active each day last week when compared to those non-enrolled students* (see Table 3). The results illustrate that those enrolled participated in more physical activity during the 7 days prior to the survey in PE class, immediately after school, and in evenings compared to those non-enrolled students. These particular findings, in terms of assessing physical activity levels, demonstrate that involvement in physical activities by those non-enrolled in PE class was low when compared to the enrolled group. These findings are in accordance with those of Allison et al. (2007) who stated that research has consistently shown that physical activity declines sharply during adolescence. Furthermore, Papacharisis and Goudas (2003) stated participation in physical education declines after the first few years in secondary school.

In terms of the PAQ-C and female adolescents, a relative comparison found that the enrolled female adolescent students were more active than the non-enrolled female adolescent students. This finding is in accordance with Welk et al. (2000) and Welk and Wood (2000) who applied the PAQ-C to classify youths as either active or non-active. Results from the PAQ-C in the present study demonstrated that in the week prior to administration of the questionnaire,

enrolled students participated in physical activities more than those non-enrolled in all venues including at school and outside of school. These findings are similar to those of Pate et al. (2007) who concluded that for those girls in grade 8 and 9, the association of PE enrolment with overall physical activity was apparently due primarily to the activity girls engaged in during PE class. Results in the current study demonstrate lower physical activity levels by those non-enrolled, a finding similar to Pate et al. who found that girls enrolled in PE in grades 8, 9, and 12 were more physically active at all three grade levels than those not enrolled. Required participation in physical education classes would provide at least a minimal amount of activity for those students who are less inclined to participate in after school activities. Overall, based on previous research it can be suggested that physical education programming should be oriented to encourage female adolescents to maintain healthy lives through participation in physical activity. The findings from the current study support previous literature because of the decrease in physical activity observed in female adolescents across grade.

### **Levels of Motivation and Enrolment in Physical Education Class**

The BREQ-2 was used to assess the levels of motivation toward physical activity behaviours between enrolled and non-enrolled female adolescents. By applying the BREQ-2 questionnaire, it was discovered that the enrolled female adolescent students would demonstrate behaviours that indicate greater intrinsic motivation based on the behavioural regulation continuum towards physical education class. Results generated from the BREQ-2 indicated that those enrolled students demonstrated higher mean scores on identified regulation and intrinsic regulation when compared to non-enrolled. When comparing results to Deci and Ryan's (2002) conceptualization of the self-determination continuum, the enrolled students exhibited greater intrinsic regulation, which is considered as the most self-determined quality of behaviour. It is

also known that identified regulation is classified under extrinsic motivation but is found closer to the intrinsic motivation end of the continuum (see Figure 1). Vallerand and Bissonette (1992) found that an individual who possesses identified regulation exhibits direction and purpose rather than obligation and pressure in performing the behaviour. They stated that the behaviour is valued and chosen by the individual, but the activity is not perceived as fun.

Overall, based on previous research, if physical activity is perceived as valuable and chosen by the individual female adolescent, motivation to participate is likely to increase and subsequently so might the student's feeling of competence. Results from the BREQ-2 identified that the enrolled female adolescent students scored higher on intrinsic regulation compared to those non-enrolled. Goudas and Biddle (1993) have stated that the success of physical education programs relies on the development of intrinsic motivation associated with exercise and participation in physical activities.

The results also demonstrated that no significant difference was found between groups in regard to extrinsic regulators. An examination of mean scores, however, suggests that extrinsic motivation may still have an influence on the participation of both groups (see Table 4). The mean scores for the external regulator and amotivation were less than 1.00, with no differences between groups. Although the means for the enrolled group were significantly greater than the non-enrolled group for identified and intrinsic regulators, the means for both groups were considerably higher than for the extrinsic measures ranging from 2.40 to 2.83. Characteristics of external motivation are control and obligation to participate as previously identified in the review of literature. According to Deci and Ryan (2002) external behaviours exhibited by the teacher such as evaluation might influence behavioral characteristics of introjected regulation. As previously identified in the review of literature, introjected regulation is a form of internalization

and is not truly self-determined since it is limited to the internalization of external contingencies (Vallerand & Bissonnette, 1992). No differences were observed between groups for introjected regulation and the means for both groups fell between the external and internal measures.

It should be stated that all conclusions derived from the BREQ-2 should be taken with precaution due to the low reliability analysis. Despite the low reliability scores reported for this tool the findings suggest that the enrolled female adolescents were more intrinsically motivated to participate as was hypothesized. It can be suggested that validity may exist without reliability, if reliability is defined as consistency among independent measures (Furr & Bacharach, 2008). The reliability analysis demonstrated low reliability scores for all subscales, especially introjected regulation and identified regulation within the BREQ-2. These low reliability scores might contribute to a lack of statistical significance- lower reliability weakens the observed effects sizes, which decreases the likelihood that a result will be statistically significant.

If the correlation between observed scores and error scores are relatively large, this would result in a relatively low reliability (Furr & Bacharach, 2008). For example, reliability will be high when the differences among participants' observed scores are consistent with the differences among their true scores (Furr & Bacharach, 2008). Given the limits of the BREQ-2, and that the results indicate low reliability estimates, the results do not truly reflect the constructs that were supposedly being measured. The main implication of these low reliability estimates for the BREQ-2 is that the researcher had to be very cautious when interpreting any results based on analysis of the BREQ-2 subscales. Future research should further examine the reliability of the BREQ-2, particularly with a younger sample.

In the present study, it was assumed that the enrolled female adolescent students would demonstrate motives that indicate greater intrinsic motivation towards participating in physical

activity based on the MPAM-R. Results generated from the MPAM-R indicated that the enrolled female students scored higher on interest and enjoyment, and demonstrated increased competence, both of which indirectly represent intrinsic motives. As well, the scores for this group were higher on fitness and social motives which indirectly represent extrinsic motivation. Results from the present study are supported by Gillison et al. (2009) who found that adolescent students reported high levels of intrinsic motivation, stating that enjoyment was either the primary reason, or one of two primary reasons for participating in sport and exercise. Based on what is known about intrinsic motives and the fact that in the current study those enrolled scored higher on interest and enjoyment, the low scores on interest and enjoyment by those non-enrolled in physical education class might have contribute to the decision to not enrol in physical education once it becomes an elective. The current MPAM-R scores suggest that those enrolled demonstrated greater levels of both intrinsic and extrinsic motives (with the exception of the appearance motive). Frederick and Ryan (1993) concluded that regardless of one's initial motive for exercising, intrinsic motivation is critical for participation. They identified that different types of physical activities attract people with different forms of motivation. They suggested that to the extent that one exercises for intrinsic reasons, an individual is more likely to feel energized, confident, and satisfied in one's activity. They also pointed out that extrinsic reasons, such as those related to body image, may have a negative influence on behaviour. The results from the present study may suggest the moderate association between interest and enjoyment motives and intrinsic motivation contribute to female adolescents' decision to enrol in physical education once it becomes an elective. In summary, results suggest that female adolescents who choose to participate in physical education are motivated both intrinsically and extrinsically,

based on interest and enjoyment and feelings of competence, as well as for social and fitness reasons (with the exception of the appearance motive).

### **Motivational Climate**

The PECCS was used to assess the perceived motivational climate in PE class of young female adolescent high school students. It was assumed that the enrolled female adolescent students would perceive the class learning climate as having a class mastery orientation. Results generated from the PECCS indicate that the enrolled female adolescents' scores were significantly higher on pursuit of progress by pupils and promotion of learning by teachers, representing class mastery orientation characteristics. These findings demonstrate that those enrolled perceived a class mastery orientation that encouraged positive social interaction, active engagement, and self-motivation. For enrolled participants, a class mastery orientation meets their developmental needs and may have an influence on them maintaining enrolment. Cury et al. (1996) stated that pupils who perceive their class to have a mastery orientation are more likely to feel competent and feel intrinsically interested in the PE class.

Results of this study are consistent with those of Ames and Archer (1988), who were the first to apply a social cognitive framework to assess classroom goals. They suggested that perceptions of a mastery climate were correlated with motivationally adaptive perceptions, such as positive class attitudes, use of effective learning strategies, and preferences for challenging tasks. Papaioannou (1994) stated that intrinsic motivation and positive attitudes towards lessons were correlated with mastery climate measures. Results from the present study support the findings of Escarti and Gutiérrez (2001) and Ntoumanis and Biddle (1999), demonstrating that enrolled female adolescents perceived their physical education climate as having a class mastery orientation and concurrently demonstrated high levels of intrinsic motivation. Cury et al. (1996)

stated that perceptions of an increasing performance-orientated PE class climate could be associated with reduced ability perceptions, at least for 'weaker' pupils more prone to failure in the normative sense. As previously stated in the review of literature, Papacharisis and Goudas (2003) and Goudas and Biddle (1993) emphasized that the success of physical education programs relies on the development of intrinsic motivation associated with exercise and participation in physical activities. The present findings and supporting literature suggests that the motivational class climate created in physical education class plays an influential role in the development of students' intrinsic motivation. Goudas and Biddle (1994) emphasized that research regarding motivational issues is crucial to developing strategies so that females continue enrolment in physical education programs.

Based on the current literature and the present study's findings it may be suggested that incorporating physical education as a required course may help to increase adolescent physical-activity participation levels. Escarti and Gutiérrez (2001) concluded that a motivational climate promoting mastery rather than performance (competition) should be developed. They also identified that to encourage young female adolescents to maintain enrolment; teachers should provide a motivational class climate that encourages intrinsic motivation through a balance between class mastery orientation and class performance orientation. Seligman (1990) stated that if students are given a sense of choice and preference it might promote self-determination and learned optimism among students. Ommundsen (2001) also suggested that teachers in PE should allow student input and choices during physical education class to promote a balanced motivational climate.

## Chapter Six: Conclusions

The current study aids in understanding the motivation behind female adolescent high school students dropping out of PE class once it becomes an elective. The present study contributes to previous studies in many ways. There are several similarities and differences between the present study and those previous studies within the review of literature. While previous studies have examined female adolescent PA levels (Faulkner et al., 2007; Cox et al., 2008; CDC, 2006), few studies have linked the association of motivation to PE enrolment on students' overall activity levels. Findings of the present study demonstrate similarities with results of previous studies. The key finding of Pate et al.'s (2007) study of grade 8, 9, and 12 female adolescent PE students was those girls enrolled in PE were more physically active at all three grade levels than those who were not enrolled. Similar to the present study, Faulkner et al. (2007) revealed a significant linear decrease in the percentage of students enrolled in Ontario high school PE classes. Bailey et al. (2004) conducted an interview based study with PE teachers to investigate why girls lose interest towards PE in the eighth and ninth grades. Issues such as; changing clothes, sweating, looking good, and team sport activities within the curriculum were factors that impacted why girls were opting out of PE once they were in high school. Similarly to the present study, Bailey et al. concluded that increased academic requirements at the high school level may deter some girls from taking PE classes, particularly when it is not a required course. The present study and the previous three published studies collectively demonstrate that the number of students enrolled in high school PE declines, as well as their overall PA participation due to numerous contributing factors cited.

The present study supports the application of the SDT framework in relation to the study of motivation in order to gain a better understanding of the reasons behind physical activity

behaviours (Deci & Ryan, 1985; Koestner & Losier, 2002; Reeve, 2002). Observations with regard to the association of female adolescent motivation to enrol and the application of the SDT are consistent with the findings of three previous studies. The key finding of Lonsdale et al. (2009) concluded that self-determined motivation may help PE programs to increase PA levels. Standage et al.'s (2005) model of motivation study based on the SDT, found that the SDT is an appropriate framework to study PE in schools. Gillison et al. (2009) concluded that girls in their study experienced introjected regulation which influenced their self-determined regulation to participate in PA. Similar to previous research, the present study applied the SDT to analyze how motivation affects PE participation. The present study and the previous three published studies collectively demonstrate the importance of female adolescents maintaining PA participation and enrollment in PE class.

Observations with regard to the influence of the motivational climate related to female adolescents' participation are consistent with the findings of four previous studies. In Goudas and Biddle's (1994) study, it was found that a mastery dimension significantly enhanced the prediction of intrinsic motivation. Escarti and Gutiérrez (2001) and Ntoumanis and Biddle (1999) reviewed the influence of motivational climate created in PE class and concluded that students who perceived their PE climate as having a class mastery orientation concurrently demonstrated high levels of intrinsic motivation. Gutierrez and Ruiz's (2009) research regarding motivational issues in PE results demonstrated the need to determine which learning climates are developed in PE lessons and the perceptions that students have about such climates. Like previous studies, the present study concluded that a motivational climate oriented more toward mastery, rather than a competitive climate, should be promoted. Researchers have indicated that social factors influence individuals' perceptions of competence, autonomy, and relatedness,

which in turn determine their motivation (Deci & Ryan, 1985; Vallerand & Losier, 1999). The present study builds on research by Ryan et al. (1997) and incorporates the BREQ-2 (regulating behaviour) and PECCS (perceived class climate) constructs.

In the current study, it was identified that enrolled students possessed higher levels of intrinsic motivation based on the BREQ-2 and MPAM-R results. Several studies have found significant relationships between the perception of motivational climate or learning environment, and intrinsic motivation in PE (Escartí & Gutiérrez, 2001), and the findings of the current study and the supporting literature suggest that intrinsic motivation possibly influences participation. Results from the present study indicate that non-enrolled female adolescents exhibited lower levels of intrinsic motivation when compared to enrolled female adolescents. Those non-enrolled in physical education class might have made the choice to not enrol because of how past physical education classes were structured and the manner in which students were evaluated. This suggests that how the non-enrolled perceived their class may have influenced their decision to enrol in physical education once it became an elective. Results suggest that assessing the perceived class climate might be useful in identifying the interrelationship of class climate, motivation and behavioural choice for adolescent females. The present study and the previous four published studies collectively demonstrate how the motivational climate in PE class influences female adolescents' motivation to enrol in PE once it becomes an elective.

Numerous differences between the present study and previous studies are evident. The present study was comprised of 200 female adolescent students ( $n_1 = 115$  enrolled and  $n_2 = 85$  non-enrolled). In contrast, Gutiérrez and Ruiz's (2009) participants consisted of 2189 secondary students', of which 1083 were girls. Pate et al.'s (2007) study consisted of 25,206 HS girls. The present study applied the BREQ-2, MPAM-R, and PECCS questionnaires. In contrast, Wilson et

al. (2004) applied the BREQ-2 to examine beliefs from the SDT but only included three extrinsic regulators, omitting integrated regulation. Pate et al. applied the 3-DPAR to investigate enrollment in PE and overall PA levels of female adolescents. The results of the present study most closely resemble the studies of Bailey et al. (2004) and Pate et al.

In conclusion, current school boards should look at what external factors may help to increase female adolescents' intrinsic motivation and consequently increase participation in PE throughout high school.

### **Limitations**

Several limitations exist in the present study design and must be acknowledged. The population could have been biased due to the time of year (May-June). This is the end of the school year when students are mentally exhausted, socially focused, and preparing for final exams. Thus, memory recall might have been influenced unintentionally. In addition, this study was a cross-sectional study. A longitudinal study would have been useful to follow a cohort of female grade 9 students enrolled in physical education class as they progress through their high school years. A possible benefit from establishing a study of this magnitude would be that researchers could measure motivation (motives and behavioural regulators) along a continuum of time (PE motivational climate). In doing so, identifying a possible relationship might prove useful in understanding the influences in which motives, behaviours, and perceived class climate regulate physical activity behaviour. Limitations with some instrument assessment and reliability analysis occurred in the present study. The PAQ-C was used for demographic purposes to assess general levels of physical activity of those enrolled and those non-enrolled (Crocker et al, 1997). As noted earlier, the PAQ-C questionnaire has been widely used to assess physical activity in children (8-14 years of age and youth from grades 4-8). In the current study,

the PAQ-C was completed by female adolescents participants aged 14 to 17 years old from grades 9 and 10 to assess their general levels of physical activity. The PAQ-C does not provide an estimate of caloric expenditure or specific frequency, time, and intensity information. Crocker et al. (1997) stated that the PAQ-C does not discriminate between specific activity intensities, such as moderate and vigorous activities.

Another limitation within the present study was the statistical output. Generally statistical models assume error free measurement, especially independent variables. However, measurements are seldom if ever without error, particularly when dealing with data such as questionnaire responses or processes which are difficult to measure precisely. Two characteristics of measurement which are important in psychological measurement are reliability and validity (Furr & Bacharach, 2008). The reliability of a test is indicated by the reliability coefficient ( $r$ ). It is expressed as a number ranging between 0 and 1.00. Reliability coefficient values .90 and up=excellent; .80-.89= good; .70-.79=adequate; below .70= may have limited applicability. An observed internal consistency coefficient level of .70 is generally an acceptable level for variables within a questionnaire. Furr and Bacharach (2008) suggest that internal consistency reliability is the degree to which a test's items are consistent with each other. They state that internal consistency is intrinsically linked to correlations among items. They suggest that if an item is relatively weakly correlated with other items on a test, then it is known that the item is generally inconsistent with the other items.

The results of the BREQ-2 questionnaire introduce a major limitation; the coefficient for the overall scale was low at 0.52. For the subscales, the observed internal consistency coefficients were low ranging from 0.25 to 0.64, and the internal consistency coefficients for the subscales introjected regulation ( $\alpha=0.25$ ) and identified regulation ( $\alpha=0.27$ ) were weak.

For example, the reliability implications of low alpha scores on the BREQ-2 demonstrates that the introjected regulation ( $\alpha=0.25$ ) observed score variance is comprised of 0.25 true score and 0.75 error variance. Similarly, the low alpha score for identified regulation ( $\alpha=0.27$ ) is comprised of 0.27 true score and 0.73 error variance. This indicates that the respondents' scores displayed measurement error of 75% and 73% respectively. The scores affect the overall reliability of the BREQ-2 which demonstrates relatively low reliability due to the high error variance in comparison to the observed score variance. Low reliability is a signal of high measurement error, which reflects a gap between what students actually know and what scores they receive. Therefore, the validity of the BREQ-2 to measure the behaviours that indicate greater intrinsic motivation based on the behavioural regulation continuum towards physical education class was not achieved. The observed internal consistency for the overall scale in the PECCS questionnaire was .70. The subscales ranged from .58 to .70, indicating levels at or slightly below the .70 criterion level. Given that some assumptions in the present study were violated, suggests that a pilot study should have occurred. This might have helped to verify the validity of applying the questionnaires to the particular age group of female adolescents.

### **Recommendations**

Fishburne and Hickson (2006) found significant benefits for children who are engaged in physical education programs. First, they are more likely to perform as well or better academically than those receiving more academic curriculum time and less physical education, indicating that PE may lead them to develop more positive attitudes about school. Second, physical education helps them to develop active lifestyles; and third, the activity improves children's self-esteem and self-concept. Pate et al. (2007) found that school-based physical

education is positioned to help provide high school students with a portion of the physical activity they need.

The present research supports the notion of the importance for senior elementary and grade 9 PE teachers to motivate female adolescents to incorporate physical activity participation into everyday life. As suggested by previous literature, this may be achieved by creating a balance between a class mastery orientation and a class performance orientation that will, in turn, lead to increased intrinsic motivation for female adolescent students in PE class. Further investigation is needed into the perceived class climate based on the PECCS, which might give insight into the ideal class climate possibly incorporating a balance between class mastery and class performance orientations.

The findings of the current study reiterate that for some female adolescent students, high school physical education class is the only structured physical activity they will participate in, which underlines its importance to physical and emotional health. Faulkner et al. (2007) suggested that collaboration between administration, faculty, and students is needed to encourage participation and the development of appropriate, engaging PE programs. These studies justify the importance behind understanding the factors that are influencing females to drop out of PE and what can be done to encourage them to maintain enrolment.

Suggested areas for improvement and/or intervention in the promotion of participation in physical education class and physical activity in the female adolescent population include: increasing the opportunity for all high school students to fit PE into their timetables; increasing the role of family members in the promotion of regular participation in physical activity; educating female adolescents about the benefits of all varieties of physical training and getting them involved in fitness classes and/or intramural sports and/or competitive sports; continuing to

identify determinants and barriers to physical activity behaviours; and finally, developing motivation strategies to overcome perceived deterrents to physical education. Applying some of these suggested recommendations may aid in motivating female students to voluntarily lead a healthy, physically active, balanced life well into adulthood.

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## **Appendices**

Appendix A: Recruitment Forms

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Appendix F: MPAM-R Questionnaire

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## Appendix A

### Recruitment Forms

**Lakehead**  
UNIVERSITY

School of Kinesiology

(807)343-8414  
(807)343-8944  
amblando@lakeheadu.ca

April, 2009

Dear Prospective Participant and Parent (Guardian),

I would greatly appreciate your participation in the following project, which is an important component of a Master of Science degree in Kinesiology being undertaken by myself, Anna Blando, at Lakehead University under the supervision of Dr. Joey Farrell. You are being asked to participate because you are an adolescent female who is enrolled in physical education class in high school.

The title of the study is "An analysis of motivation and motivational climate towards physical education class of enrolled and non-enrolled female adolescent high school students."

Prior to participation, you will be required to complete and sign the consent form. You will also be asked to fill in five questionnaires which will provide information regarding your experience as a female adolescent enrolled in physical education class.

Prior to questionnaire administration, a brief overview of each questionnaire will be completed under the supervision of Ms. Blando. The questionnaires will be administered in the physical education class setting. You will be asked to fill out all questionnaires and hand them back to Ms. Blando upon completion. This process will take approximately 15 to 20 minutes of the participants' time.

Participation in this study is voluntary; you have the right to withdraw at any time. All information that you provide will be strictly confidential. Only the researcher Ms. Blando and Dr. Farrell will have access to the recorded data and personal information. Data will be securely stored by Dr. Farrell at Lakehead University for a period of 5 years.

Full anonymity and confidentiality will be observed during the course of research, in the final report, and in the presentation of the results.

If you agree to participate in this study, please complete the attached consent form and return it by the specified date. If you have any questions, please feel free to contact me at (807) 343-8414 or e-mail me at amblando@lakeheadu.ca. You may also contact my faculty advisor Dr. Joey Farrell at (807) 346-7754 or email joey.farrell@lakeheadu.ca. You may also contact the Lakehead University Research Ethics Board at (807) 343-8283.

Thank you for your cooperation.  
Yours truly,

Anna Blando  
Research Investigator  
Master of Science candidate  
School of Kinesiology  
Lakehead University

# Lakehead

UNIVERSITY

School of Kinesiology

(807)343-8414

(807)343-8944

amblando@lakeheadu.ca

April, 2009

Dear Prospective Participant and Parent (Guardian),

I would appreciate your participation in the following project, which is an important component of a Master of Science degree in Kinesiology being undertaken by myself, Anna Blando, at Lakehead University under the supervision of Dr. Joey Farrell. You are being asked to participate because you are an adolescent female who is not currently enrolled in physical education class.

The title of the study is "An analysis of motivation and motivational climate towards physical education class of enrolled and non-enrolled female adolescent high school students.

Prior to participation, you will be required to complete and sign the consent form. You will also be asked to fill in five questionnaires which will provide information regarding your past experience as a female adolescent in physical education class.

Prior to questionnaire administration, a brief overview of each questionnaire will be completed under the supervision of Ms. Blando. The questionnaires will be administered in the library. You will be asked to fill out all questionnaires and hand them back to Ms. Blando upon completion. The total time required to complete this study will be approximately 15 to 20 minutes.

Participation in this study is voluntary; you have the right to withdraw at any time. All information that you provide will be strictly confidential. Only the researcher Ms. Blando and Dr. Farrell will have access to the recorded data and personal information. Data will be securely stored by Dr. Farrell at Lakehead University for a period of 5 years.

Full anonymity and confidentiality will be observed during the course of research, in the final report, and in the presentation of the results.

If you agree to participate in this study, please complete the attached consent form and return it by the specified date. If you have any questions, please feel free to contact me at (807) 343-8414 or e-mail me at amblando@lakeheadu.ca. You may also contact my faculty advisor Dr. Joey Farrell at (807) 346-7754 or email joey.farrell@lakeheadu.ca. You may also contact the Lakehead University Research Ethics Board at (807) 343-8283.

Thank you for your cooperation.

Yours truly,

Anna Blando  
Research Investigator  
Master of Science candidate  
School of Kinesiology  
Lakehead University

## Appendix B

### Consent Form

**Lakehead**  
UNIVERSITY

School of Kinesiology

(807)343-8414

(807)343-8944

amblando@lakeheadu.ca

#### Consent Form

I \_\_\_\_\_, agree to participate in a study titled "An analysis of motivation and motivational climate towards physical education class of enrolled and non-enrolled female adolescent high school students."

The purpose of the study is to investigate the relationship between motivation towards physical education class and classroom climate of enrolled and non-enrolled female adolescent high school students.

The study is being conducted by Anna Blando, a graduate student in the School of Kinesiology at Lakehead University, under the supervision of Dr. Joey Farrell. I have read and understand the participant recruitment letter.

I understand that I will be required to fill out the five questionnaires within the Questionnaire Package which will provide information regarding my experience as a female adolescent enrolled in physical education class. I will be given adequate explanation of each questionnaire and the components of the questionnaires.

I understand that the potential risks in this study are minimal because I will be completing questionnaires with no physical activity skill involved.

I understand that my participation in this study is voluntary, and that I may withdraw from this study at any time and for any reason. I also understand that my identity will remain anonymous and all data will be kept strictly confidential and only Ms. Blando and Dr. Joey Farrell will have access to these data. No identifiable characteristics will be used in the final report or in the presentation of the results. The data will be securely stored by Dr. Joey Farrell for a period of five years.

Name of Participant: \_\_\_\_\_

Name of Parent/Guardian: \_\_\_\_\_

Signature of Parent/Guardian: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix C

### Demographic Questionnaire

#### DEMOGRAPHIC QUESTIONNAIRE

**Directions:** Please answer the following questions with the appropriate information in the space provided.

Name: \_\_\_\_\_

Gender: \_\_\_\_\_ Birthday: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ (m/d/yr) PE Teacher Gender: \_\_\_\_\_

What are your intentions to complete further credits in physical education class when it becomes an elective?

1	2	3	4	5
Strongly do not plan to enrol	Will not enrol	Have not decided yet	Plan to enrol	Strongly will continue to enrol

Do you prefer co-ed physical education class or female only? \_\_\_\_\_

What do you **most like and/or enjoy** about physical education class?

---



---

What do you **least like and/or enjoy** about physical education class?

---



---

If you could design the physical education curriculum what suggestions would you make?

---



---



---

## Appendix D

### PAQ-C Questionnaire

#### *Physical Activity Questionnaire (Elementary School)*

In this section we would like to collect information about your level of physical activity in the last 7 days.

**Remember:**

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

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 .....	<input type="radio"/>				
Rowing/canoeing .....	<input type="radio"/>				
In-line skating .....	<input type="radio"/>				
Tag .....	<input type="radio"/>				
Walking for exercise .....	<input type="radio"/>				
Bicycling .....	<input type="radio"/>				
Jogging or running .....	<input type="radio"/>				
Aerobics .....	<input type="radio"/>				
Swimming .....	<input type="radio"/>				
Baseball, softball .....	<input type="radio"/>				
Dance .....	<input type="radio"/>				
Football .....	<input type="radio"/>				
Badminton .....	<input type="radio"/>				
Skateboarding .....	<input type="radio"/>				
Soccer .....	<input type="radio"/>				
Street hockey .....	<input type="radio"/>				
Volleyball .....	<input type="radio"/>				
Floor hockey .....	<input type="radio"/>				
Basketball .....	<input type="radio"/>				
Ice skating .....	<input type="radio"/>				
Cross-country skiing .....	<input type="radio"/>				
Ice hockey/ringette .....	<input type="radio"/>				
Other: .....	<input type="radio"/>				
.....	<input type="radio"/>				
.....	<input type="radio"/>				

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 do most of the time *at recess*? (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, 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 .....

5. 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 .....

6. 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 times last week .....   
 6 or 7 times last week .....

7. 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 .....

8. 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.

- A. All or most of my free time was spent doing things that involve little physical effort .....
- B. 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) .....
- C. I often (3 — 4 times last week) did physical things in my free time .....
- D. I quite often (5 — 6 times last week) did physical things in my free time ...
- E. I very often (7 or more times last week) did physical things in my free time .

9. 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 .....	<input type="radio"/>				
Tuesday .....	<input type="radio"/>				
Wednesday ....	<input type="radio"/>				
Thursday .....	<input type="radio"/>				
Friday .....	<input type="radio"/>				
Saturday .....	<input type="radio"/>				
Sunday .....	<input type="radio"/>				

10. 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? \_\_\_\_\_

11. What additional activities or chores have you participated in at home in the last 7 days? (Please use back of page if you need additional space.)

## Appendix E

### BREQ-2 Questionnaire

The Behavioural Regulation in Exercise Questionnaire-2 (BREQ-2)  
(Markland, 2000)

Name: \_\_\_\_\_ Age: \_\_\_\_\_ years

Gender: Male or Female (please circle) Grade: \_\_\_\_\_

#### WHY DO YOU ENGAGE IN EXERCISE?

*Exercise is a planned, structured, and repetitive bodily movement performed to improve and/or maintain physical fitness.*

*We are interested in the reasons underlying peoples' decisions to engage, or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you.*

*Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise as defined above. Your responses will be held in confidence and only used for our research purposes.*

	Not true for me 0	1	Sometimes true for me 2	3	Very true for me 4
1. I exercise because other people say I should	0	1	2	3	4
2. I feel guilty when I don't exercise	0	1	2	3	4
3. I value the benefits of exercise	0	1	2	3	4
4. I exercise because it's fun	0	1	2	3	4
5. I don't see why I should have to exercise	0	1	2	3	4
6. I take part in exercise because my friends/family/partner say I should	0	1	2	3	4
7. I feel ashamed when I miss an exercise session	0	1	2	3	4
8. It's important to me to exercise regularly	0	1	2	3	4

	Not true for me		Sometimes true for me		Very true for me
	0	1	2	3	4
9. I can't see why I should bother exercising	0	1	2	3	4
10. I enjoy my exercise sessions	0	1	2	3	4
11. I exercise because others will not be pleased with me if I don't	0	1	2	3	4
12. I don't see the point in exercising	0	1	2	3	4
13. I feel like a failure when I haven't exercised in a while	0	1	2	3	4
14. I think it is important to make the effort to exercise regularly	0	1	2	3	4
15. I find exercise a pleasurable activity	0	1	2	3	4
16. I feel under pressure from my friends/family to exercise	0	1	2	3	4
17. I get restless if I don't exercise regularly	0	1	2	3	4
18. I get pleasure and satisfaction from participating in exercise	0	1	2	3	4
19. I think exercising is a waste of time	0	1	2	3	4

## Appendix F

### MPAM-R Questionnaire

Motives for Physical Activities Measure – Revised (MPAM-R)  
(Fredrick & Ryan, 1993)

The following is a list of reasons why people engage in physical activities, sports and exercise. Keeping in mind your primary physical activity/sport, respond to each question (using the scale given); on the basis of how true that response is for you.

- | 1   | 2 | 3 | 4 | 5 | 6 | 7                   |
|---|---|---|---|---|---|---------------------|
| Not at all<br>true for me   |   |   |   |   |   | Very true<br>for me |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 1. Because I want to be physically fit.                                   |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 2. Because it's fun.  |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 3. Because I like engaging in activities which physically challenge me.   |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 4. Because I want to obtain new skills.                                   |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 5. Because I want to look or maintain weight so I look better.            |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 6. Because I want to be with my friends.                                  |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 7. Because I like to do this activity.                                    |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 8. Because I want to improve existing skills.                             |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 9. Because I like the challenge.  |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 10. Because I want to define my muscles so I look better.                 |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 11. Because it makes me happy.  |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 12. Because I want to keep up my current skill level.                     |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 13. Because I want to have more energy                                    |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 14. Because I like activities which are physically challenging.           |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 15. Because I like to be with others who are interested in this activity. |   |   |   |   |   |                     |
| <input type="checkbox"/>  |   |   |   |   |   |                     |
| 16. Because I want to improve my cardiovascular fitness.                  |   |   |   |   |   |                     |

- | 1                         | 2 | 3 | 4 | 5 | 6 | 7                   |
|---------------------------|---|---|---|---|---|---------------------|
| Not at all<br>true for me |   |   |   |   |   | Very true<br>for me |
- \_\_\_ 17. Because I want to improve my appearance.
- \_\_\_ 18. Because I think it's interesting.
- \_\_\_ 19. Because I want to maintain my physical strength to live a healthy life.
- \_\_\_ 20. Because I want to be attractive to others.
- \_\_\_ 21. Because I want to meet new people.
- \_\_\_ 22. Because I enjoy this activity.
- \_\_\_ 23. Because I want to maintain my physical health and well-being.
- \_\_\_ 24. Because I want to improve my body shape.
- \_\_\_ 25. Because I want to get better at my activity.
- \_\_\_ 26. Because I find this activity stimulating.
- \_\_\_ 27. Because I will feel physically unattractive if I don't.
- \_\_\_ 28. Because my friends want me to.
- \_\_\_ 29. Because I like the excitement of participation.
- \_\_\_ 30. Because I enjoy spending time with others doing this activity.

## Appendix G

### PECCS Questionnaire

#### Physical Education Class Climate Scale (Escartí, A., & Gutiérrez, M., 2001)

"In my Physical Education (PE) class....."		1	2	3	4	5
		Not at all			Very much so	
1	The pupils are very pleased when they learn new skills and games	1	2	3	4	5
2	Pupils try to do better than one another	1	2	3	4	5
3	The PE teacher is pleased when each pupil learns something new	1	2	3	4	5
4	The teacher particularly appreciates those who win	1	2	3	4	5
5	The pupils worry about making mistakes	1	2	3	4	5
6	What the pupils learn encourages them to practise more	1	2	3	4	5
7	The pupils are very satisfied when they do better than others	1	2	3	4	5
8	The PE teacher is pleased when everyone progresses after having put in some effort	1	2	3	4	5
9	The PE teacher only bothers with those who do well in sport	1	2	3	4	5
10	The pupils are afraid of getting things wrong	1	2	3	4	5
11	The pupils learn new things and feel pleased	1	2	3	4	5
12	It's when pupils do better than others that they are most happy	1	2	3	4	5
13	The PE teacher is pleased when everyone's skills progress	1	2	3	4	5
14	The pupils are afraid of trying things that they might get wrong	1	2	3	4	5
15	The pupils are happy when they do their best to learn	1	2	3	4	5
16	The PE teacher is pleased when everyone improves	1	2	3	4	5
17	The teacher encourages those who are good at sport	1	2	3	4	5
18	The pupils are afraid of trying things at which they might make mistakes	1	2	3	4	5
19	The pupils are very happy when they correctly perform a movement they have learnt	1	2	3	4	5