

The Relationship Between Social Support and Adherence to a Peer-Based Physical  
Activity Program Among Adolescent Girls: A Pilot Study

by

Linda Trinh  
B.P.H.E., B.A., Queen's University, 2005

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Supervisory Committee

Dr. Patti-Jean Naylor, Supervisor  
(School of Exercise Science, Physical and Health Education)

Dr. Ryan E. Rhodes, Departmental Member  
(School of Exercise Science, Physical and Health Education)

Dr. John O. Anderson, Outside Member  
(Department of Educational Psychology & Leadership Studies)

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### ABSTRACT

*Purpose:* To explore the relationship between social support and adherence to a peer-based program among adolescent girls using the Theory of Planned Behaviour (TPB), and to explore barriers and facilitators related to physical activity. *Methods:* Participants (N=13) completed self-reported measures of social support, TPB constructs, adherence to the program, and physical activity behaviour. A one-month follow-up was conducted on all baseline measures. Open-ended questions were used to determine facilitators and barriers to physical activity. *Results:* At baseline, social support was a significant correlate of subjective norm ( $r=0.58, p<.05$ ). At post-program, frequency of attending the program with friends ( $r=0.97, p<.01$ ) was a significant correlate of attendance in the program. Also, social support was a significant correlate of PBC at post-program ( $r=-0.82, p<.01$ ). *Conclusions:* A physical activity program targeting peer social support may serve as a viable mechanism for increasing physical activity levels in adolescent girls.

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## CHAPTER I

### Introduction

The importance of physical activity promotion for children and youth has been well established (Troost, Saunders, & Ward, 2002). Regular participation in physical activity is an essential component of a healthy lifestyle (Troost et al., 2002). A large body of evidence suggests that increasing physical activity levels in less active groups has the potential to contribute to enhanced physical and mental health, as well as preventing a number of diseases and other problems later in life (Allison et al., 2005; Anderssen & Wold, 1992). Among adolescents, regular physical activity reduces the onset of a number of cardiovascular disease risk factors including elevated blood lipids and obesity and is positively associated with physical fitness, HDL cholesterol, bone mineral density, and psychological well-being (Troost et al., 2002). Furthermore, because physical activity habits developed early in life may continue into adulthood, adopting adequate physical activity levels during childhood and adolescence is important to prevent chronic diseases later in life (Troost et al., 2002; Rhodes, Macdonald, & McKay, 2006; Allison et al., 2005; Anderssen & Wold, 1992).

Despite the array of information that demonstrates the health benefits of regular physical activity, recent evidence shows that Canadian youth are not active enough to meet international guidelines for optimal growth and development (CFLRI, 2004). According to the 2004 Physical Activity Monitor and Sport, approximately 49% of Canadian youth are active during their leisure time, but only 21% are accumulating enough daily activity to meet international guidelines for optimal growth and development. Approximately 27% of boys, almost twice as many as girls (14%), are

likely to reach international guidelines for optimal growth and development; with youth aged 12-14 years of age more likely to be active than those aged 15-19 (CFLRI, 2004). The percentage of youth who are physically active has increased over the past decade, with physical activity levels increasing significantly over the last two years. Although this is promising, physical activity levels in youth are still far from adequate (CFLRI, 2004). Canada's Physical Activity Guides for Children and Youth recommend that children and youth increase the amount of time they are physically active by at least 30 minutes more per day, eventually accumulating at least 90 minutes of PA per day over the long-term (Public Health Agency of Canada, 2002).

Adolescence is an important period for acquiring health-related behaviour patterns that will carry over into adulthood (Anderssen & Wold, 1992). As physically active adolescents are more likely to remain active throughout the lifespan, the promotion of adolescent physical activity is important. (Duncan, Duncan, & Strycker, 2005). However, encouraging children and youth to adopt and maintain regular physical activity habits are the main challenges that are facing behavioural scientists and physical activity professionals today (Wold & Anderssen, 1992; Nahas, Goldfine, & Collins, 2003). Enhanced understanding of the determinants of physical activity during adolescence will enable the development of interventions that promote physical activity habits and health benefits to adolescents (Godin, Anderson, Lambert, & Descharnais, 2005).

Social support has been cited as an important correlate of physical activity for adolescents, especially females. As children age, they spend increasing amounts of time with friends compared with family, therefore increasing the potential influence of peers in a number of domains (Duncan et al., 2005; Wold & Anderssen, 1992; Anderssen &

Wold, 1992). More specifically, peers are an important source of social support for adolescent physical activity and also contribute to efficacy beliefs regarding physical activity (Duncan et al., 2005). The support of peers may serve a number of different objectives: social integration or companionship; emotional support such as encouragement; informational support; instrumental support, such as sharing equipment and transportation; esteem support and/or reassurance of worth (Duncan et al., 2005).

The role of peer support in adolescence may be best understood through theoretical models of human motivation. Many theories have been applied to physical activity behaviour to help understand the multidimensional factors that influence participation. The Theory of Planned Behaviour is one of the most extensively used theories in the physical activity domain (Biddle & Nigg, 2000). The Theory of Planned Behaviour suggests that behaviour can best be predicted from an individual's intention, which is a function of three variables: attitudes (positive or negative evaluation of performing the behaviour), subjective norms (perceived influences that significant others may have over the behaviour), and perceived behavioural control (assessment of volitional control over the behaviour) (Ajzen, 1991).

Although research has suggested that peer support influences participation in physical activity among adolescents, few studies have included a peer-based component in the physical activity interventions. Therefore, the mechanisms through which peer social support might influence physical activity behaviour are not well understood. Understanding how peer support relates to adherence and physical activity levels in a peer-based physical activity program for adolescent girls will aid future intervention efforts aimed at increasing levels of physical activity.

### *Purpose*

The purpose of this study therefore, was to explore the relationship between social support and adherence to a peer-based program among adolescent girls using the Theory of Planned Behaviour as a theoretical framework and to further explore the barriers and facilitators of physical activity among this age group.

### *Research Questions*

The primary research question was: Was there a relationship between social support, exercising with a peer, adherence to physical activity and overall physical activity levels among adolescent girls? The two secondary research questions were: Was there a relationship between the Theory of Planned Behaviour constructs and social support, physical activity levels, and program attendance among adolescent girls? Were there barriers and facilitators associated with participating in the peer-based physical activity program among adolescent girls?

### *Hypotheses*

Hypothesis 1: Physical activity participation accompanied by peers is positively associated with physical activity levels and program attendance among adolescent girls.

Hypothesis 2: Social support is positively related to physical activity levels, program attendance, and frequency of program attendance with peers among adolescent girls.

Hypothesis 3: The Theory of Planned Behaviour constructs (namely subjective norm) are positively related to social support, physical activity levels and program attendance among adolescent girls.

### *Operational Definitions*

The following are the operational definitions for how the variables were treated in this study, and to allow the results that were generated to be adequately evaluated:

*Adolescent:* Adolescence refers to the period of psychological and social transition between childhood and adulthood. It is a unique stage of development characterized by many physiological, cognitive, psychosocial, and sexual changes. For this study, middle adolescence (13-17 years) was examined, and it included adolescent girls only.

*Physical activity* refers to any bodily movement produced by the skeletal muscle that results in energy expenditure (Casperson, Powell, & Christenson, 1985). Physical activity was measured as the frequency of moderate vigorous physical activity in a week as measured by a modified version of the Godin Leisure-Time Exercise Questionnaire (Appendix H). Physically active females were identified as participating in moderate-strenuous physical activity 3 or more times per week. Inactive females were identified as participating in moderate-strenuous physical activity fewer than 3 times per week.

*Peer: Peer group* is defined as an adolescent's group of friends, that is people of the same age, with similar backgrounds and interests (Csikszentmihalyi & Larson, 1984).

*Peer influence* can occur in the form of direct and indirect influence. Direct peer influence occurs in the form of encouragement, dares, or actual offers (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001). Indirect peer influence is defined as the effects on specific behaviours and attitudes by means of their impact on other attitudes held by the individual. It also refers to the association with peers who exhibit similar behaviours, providing role models, establishing behaviour as normative, and creating the perception that behaviour might increase social acceptance (Simons-Morton et al., 2001).

*Social support* refers to the aid and assistance exchanged through social relationships and interpersonal transactions, or the perception of assistance in performing the behaviour (Heaney & Israel, 1997). Social support was measured using a modified Social Support for Diet and Exercise Behaviours (Sallis, Grossman, Pinski, Patterson, & Nader, 1987). We modified the scale to include only the social support and exercise behaviour from friends questions (Appendix J).

*Adherence* refers to engaging in physical activity at least 3 times a week for at least 30 minutes. Physical activity should include a combination of moderate activity (such as bike riding, brisk walking, skating, etc.) and vigorous activity (such as running, soccer, hockey, etc.) (Public Health Agency of Canada, 2002)

and was measured as the number of times an individual attended the program or came to the gym facility over a 4-week period as recorded by the physical activity tracking sheet (Appendix I).

### *Delimitations*

This study was delimited to female adolescents aged 13-17 recruited from two secondary schools, and a recreation centre in one geographical area of Vancouver Island, Canada which was Victoria, British Columbia. All participants were recruited on a voluntary basis, and thus they likely represented a sample that was more enthusiastic about physical activity participation than would have been represented by a random sample.

## CHAPTER II

### Review of Literature

This chapter reviews the literature relating to peer social support and physical activity participation, as well as the application of the Theory of Planned Behaviour constructs in the physical activity domain among adolescents. In the first section, an overview of the adolescent period and related peer networks are examined. In the second section, the determinants of physical activity in adolescents are reviewed with a focus on physical activity levels among female adolescents. The third section addresses the current literature on peer relationships and adolescents, encompassing the peer acceptance, quality of friendship, and social support literature in physical activity and sport contexts. The final section of the review examines the Theory of Planned Behaviour as it relates to adolescents in the physical activity domain. The purpose of this review of literature is to provide a conceptual foundation for researching and understanding the relationship between peers and social support on physical activity behaviour among adolescents.

#### *Overview of the Adolescent Period*

##### *Developmental tasks.*

Adolescence is a unique stage of development that is accompanied by many physiological, cognitive, psychosocial, and sexual changes. The health habits and coping skills developed during this period carry into adulthood, and the mastery of certain developmental tasks during this period assist the adolescent's entry into adulthood (Leifer & Hartston, 2004). There are several developmental tasks, both personal and social tasks, encountered during adolescence, and they include: developing self-identity in light of

physical changes; developing gender identity; gaining a degree of independence from parents; accepting or rejecting family values; shaping up an occupational (or unemployed) role; and developing and extending close peer relationships (Hendry, 1989; Leifer & Hartston, 2004).

*Cognitive development.*

Jean Piaget, a Swiss psychologist, emphasized cognitive milestones in development. Piaget described four stages of development related to learning to understand and related to the world logically, and they are: sensorimotor (birth to 2 years); preoperational (2 to 7 years); concrete operations (7 to 11 years); and formal operations (adolescence) (Leifer & Hartston, 2004). Young adolescents are in the concrete phase of thinking, which means that they interpret words and concepts literally. They can understand more than one piece of information at a time, and have a realistic understanding of the world. Their primary focus is on the present, rather than the future (Leifer & Hartston, 2004).

By middle adolescence they begin to think more abstractly, and this stage is characterized as the formal operation stages according to Piaget. In this stage, adolescents can process information quickly and efficiently, and their thinking becomes more complex. During this period, adolescents may become self-absorbed and self-conscious, often worrying about how others perceive them (Leifer & Hartston, 2004). They can also spend countless hours examining and experimenting with hairstyles and dress, feeling that they need to impress others. At other times, adolescents may perceive themselves as unique and powerful, and they may try to manipulate rules, engage in risky behaviours, or deny their own mortality (Leifer & Hartston, 2004). The early adolescent

is motivated by the desire to conform and please others, whereas the late adolescent bases moral principles on their own individual thinking and beliefs (Leifer & Hartston, 2004).

*Psychosocial development.*

Erik Erikson's psychosocial theory describes the parts of personality development that are dependent on the social environment and social interactions through eight stages. Each stage involves a social crisis or task that must be positively resolved before successfully entering into the next stage. For example, failure to establish trust with caregivers in the infant stage of development may affect the later life stage of intimacy during adolescence, which is based on the ability to establish trust with another person. Successfully passing through each of these stages is thought to contribute to the overall development of the individual personality, with unique strengths and weaknesses (Leifer & Hartston, 2004).

According to stage six in Erikson's psychosocial theory of intimacy vs. isolation, one of the primary tasks of adolescence is achieving a stable self-identity. Adolescents may try out various temporary styles and social roles in the process of finding their own individual identity. Identity exploration may sometimes lead to role confusion where the adolescent can over commit to many causes and appear to go through personality changes (Leifer & Hartston, 2004). In order to achieve a sense of their own identity, adolescents must believe their identities are separate from their role as a child in their family (Leifer & Hartston, 2004). The family may assist the adolescent in securing a positive outcome in achievement of this task by offering support and guidance, and by offering the freedom to discover different roles and ideas. Close relationships with peers are also essential for assisting adolescents in exploring different roles and ideas (Leifer & Hartston, 2004).

In early adolescence, close friendships develop mainly with same-sex friends, where they validate each other's thoughts and actions and may imitate each other's traits and habits. During middle adolescence, adolescents are concerned with how they look and whom they date. Experimentation with sex and other social behaviours often occur at this age, and a sense of supremacy combined with curiosity may lead them to engage in other risk-taking behaviours. In late adolescence, school performance, interaction with teachers and counsellors, and participation in extracurricular activities can influence their successful achievement of career goals (Leifer & Hartston, 2004).

*The role of peer relationships.*

In the transition to adulthood, the peer group has been regarded as an important context for the growth to independence for many adolescents. There are many reasons to suggest that peer relationships may be important to adolescents' decisions about the extent to which they become involved or continue to become involved in physical activity. In early childhood, parents and siblings occupy the most important behavioural role models, and the role of peer influence is believed to increase with age (Eccles, 1999). During adolescence, the peer group becomes more salient to adolescents and their social roles and relationships within the family and within peer networks typically become redefined (Patrick et al., 1999).

Leisure activities may be chosen for their personal meaning and for social expression, and these choices are affected by influences such as the family and peers (Patrick et al., 1999). In addition to influencing time use, peers may affect adolescents' decisions about their involvement in physical activity through the type and amount of social support that they provide. Adolescents have indicated that they concentrate on

social support from their peers as they transition into adolescence, and throughout the developmental period (Patrick et al., 1999). Perceived peer support may be a contributing factor to adolescents' commitment to physical activity (Patrick et al., 1999). Another reason why adolescents' relationships with peers may be associated with their commitment is related to the link between identity perceptions and peer relationships. Peers can influence adolescents' perceptions of identity through the messages they explicitly and implicitly display. Through such feedback, adolescents can encourage or discourage others' commitment to physical activity since peer evaluation can affect one's sense of self-worth and self-esteem (Patrick et al., 1999; Smith, 1999). Furthermore, peers contribute to enjoyment of physical activity through recognition of accomplishments, companionship, and esteem support (Patrick et al., 1999; Smith, 1999).

Peer relationships have a significant impact on adolescent growth and development. Belonging to a group is typically of great importance for adolescents. From this social group, the adolescent usually chooses a best friend, who enables them to experience mutual sharing of private thoughts and feelings. This is important in normalizing and validating experiences and in forming successful relationships later in life (Leifer & Hartston, 2004). Since more time is spent with peers than family during adolescence, the adolescent may feel compelled to conform to peer pressures, which can create problems and conflicts with family if the values of the peer group conflict with family values or traditions. Failure to connect with a peer group can cause feelings of loneliness, loss, and interpersonal failure, which may contribute to feelings of lowered self-esteem or feelings of inadequacy (Leifer & Hartston, 2004).

There is evidence that adolescents' friendships and peer relationships differ by gender. Peer relationships in female adolescents are characterized by greater intimacy and by smaller and more exclusive peer groups compared to male adolescents, which encompass a larger peer group (Patrick et al., 1999; Poole, 1989). In addition, female adolescents on average value social relationships to a greater extent compared to males (Berndt, 1982; Clark-Lempers, Lempers, & Ho, 1991). In addition, gender is a key variable in shaping social networks and in relating to peer group members (Berndt & Perry, 1986; Furman & Buhrmester, 1985). Gender differences in peer relationships are not discovered until early adolescence (about Grade 5 or 6), and these differences are found in the domain of friendship support dimensions of intimacy, emotional support, affect, and esteem enhancement (Berndt & Perry, 1986; Furman & Buhrmester, 1985). Adolescent girls tend to place greater emphasis on these dimensions compared with boys. Other differences in friendship support are found in younger children (under 10 years of age), who tend to focus on explicit, behavioural characteristics such as help and guidance, prosocial behaviour, and physical features of individuals (Berndt, 1989; Berndt & Perry, 1986; Newcomb & Bagwell, 1995). On the other hand, adolescents (10 to 14 years old) tend to focus on dimensions that characterize psychological concepts such as intimacy, loyalty, emotional support, and esteem enhancement (Berndt, 1989; Berndt & Perry, 1986; Newcomb & Bagwell, 1995).

#### *Determinants of Physical Activity in Children and Adolescents*

Physical activity has important health benefits for youth and since many of them are not meeting established guidelines, improving the physical activity of adolescents is an important public health challenge (Sallis, Prochaska, & Taylor, 2000). Population

surveys indicate that as many as 79% of Canadian youth are not active enough to meet international guidelines for optimal growth and development (CFLRI, 2004). These alarming statistics call for an understanding of the determinants of physical activity in youth in order to develop effective physical activity interventions to reduce the onset of disease and mortality.

The correlates of physical activity have been previously explored in a review by Sallis et al. (2000). Results from the comprehensive review indicated that among adolescents aged 13-18 years old, the most consistent correlates of physical activity included male sex, ethnicity (Caucasian), age (inverse relationship), perceived activity competence, intentions, depression (inverse relationship), previous physical activity, community sports, sensation seeking, sedentary after school and on weekends (inverse relationship), parental support, support from others, sibling physical activity, direct help from parents, and opportunities to exercise (Sallis et al., 2000). These variables and other potential correlates can be further classified into multiple domains including demographic and biological variables (e.g. age, gender, ethnicity); psychological, cognitive, and emotional variables (e.g. attitudes, intention to exercise, personality variables); behavioural variables (e.g. activity history, skills for coping with barriers, participation in sports); social and cultural variables (e.g. peer modeling, parent/peer/sibling/teacher/coach support, past family influences); and physical environment variables (e.g. access to facilities, opportunity to be physically active) (Sallis & Owen, 1999). By placing the correlates of physical activity in adolescents into general categories, it can help identify potential mediators of physical activity that can be targeted for change in interventions,

and those that can only serve as markers of potential risk or targets for future interventions, such as gender and age (Sallis et al., 2000; Gustafson & Rhodes, 2006).

Age and gender are two major biological determinants of physical activity in adolescents. Identifying demographic variables that are related to activity can help prioritize subgroups for interventions (Sallis, Prochaska, Taylor, Hill, & Geraci, 1999). The typical pattern during adolescence indicates a decrease in activity with increasing age (or grade), compounded by lower levels of activity exhibited among females compared to males (Allison et al., 2005; Voorhees et al., 2005).

The most consistent modifiable correlates that have the strongest evidence of association with youth physical activity are self-efficacy, perceived physical competence, perceived benefits, intentions to be active, enjoyment of physical activity, social support from family and friends, access to play spaces and equipment, and time spent outdoors (USDHHS, 1996). Social variables may represent some of the most important modifiable correlates of youth physical activity. Many studies have found a significant association between physical activity and social support from family and friends (Sallis et al., 1999; Sallis & Owen, 1999). Social support is considered an interpersonal variable that can influence behaviour directly or indirectly. Direct support arises through situations where individuals exercise together or perform home tasks such as taking care of children or cleaning the house for the spouse to exercise, for example (Nahas et al., 2003). On the other hand, indirect support can just be talking or encouraging a friend or family member to become more active (Nahas et al., 2003).

*Physical activity among female adolescents.*

Findings from several studies indicate that the decline in physical activity among girls begins at age 11 or 12, which is the time of transition into middle school (Leslie et al., 1999; Trost, Pate, Saunders, Ward, Dowda & Felton, 1997). The most consistently supported finding with physical activity levels among adolescents was that boys were more active than girls, and this implies that special efforts are needed to increase physical activity levels in girls (Sallis, Prochaska, & Taylor, 1999). Some of the barriers to physical activity that are prevalent among girls are feelings of self-consciousness, lack of motivation, feelings associated with having a bad or tiring day, time constraints, influence of peers, parents, and teachers, inaccessibility of facilities and the cost of using them, and wanting to do other things (Robbins, Pender, & Kazanis, 2003; Neumark-Sztainer, Story, Hannan, Tharp, & Rex, 2003; Dwyer et al., 2006). Strong motivators of physical activity among girls include opportunities for involvement in activities that are fun and preferred, and social support and encouragement from parents and friends such as having most or all friends exercising and belonging to in physical activity (Robbins et al., 2003; Neumark-Sztainer et al., 2003; Saxena, Borzekowski, & Rickert, 2002; Trinh, Rhodes, & Ryan, in press). Consistent with previous research, other studies have also found that frequency of activity with friends was the most significant independent predictor of girls' own activity. In other words, girls who participate in activities with their peers report higher levels of physical activity when compared to those who indicate less peer activity involvement (Voorhees et al., 2005; Bungum & Vincent, 1997).

To prevent this decline in physical activity among girls, it is essential to identify and understand the factors correlated with physical activity levels. Peers are a potentially

important source of social support for adolescent physical activity. With adolescence comes an increase in the time spent with peers and less time spent with family (Patrick et al., 1999). Peers become very influential in early adolescence, and therefore are likely to have significant influence on the motivation of adolescents to become physically active (Vazou, Ntoumanis, & Duda, 2005).

#### *Peer Relationships in Physical Activity Contexts*

In the transition to adulthood, the peer group has been regarded as an important context for the growth to independence for many adolescents. Adolescents spend more time with their peers in school, sports, extracurricular activities, and during their free time interacting and socializing (Moran & Weiss, 2006). Because the settings in which adolescents interact with their peer group can be both formal and informal, there is also a range of peer relationships (Bukowski & Hoza, 1989; Rubin, Bukowski, & Parker, 1998). Adolescents can be engaged with their peers in either dyadic or unilateral friendships. A dyadic friendship is characterized by two individuals who are equally engaged in maintaining a relationship, whereas a unilateral friendship is characterized by popularity or peer-group acceptance which demonstrates that how a group views an individual determines group standing or status (Bukowski & Hoza, 1989; Rubin et al., 1998).

Little research has specifically explored peer relationships in physical activity settings. The overwhelming bulk of research on social influence in youth sport and physical activity has emphasized the role of coaches, teachers, and parents in governing psychosocial and behavioural outcomes (Smith, 2003). Two areas make up the bulk of the research in peer relationships, one examining acceptance within the peer group (peer

acceptance) and the other examining the importance of youth friendships (friendship) (Smith, 1999).

*Peer acceptance.*

Sport-related research examining peer acceptance or status suggests that competence in the physical domain is highly valued among adolescents because the central source of competence information is peer comparison and feedback during this developmental period (Weiss & Duncan, 1992; Horn & Weiss, 1991). Weiss and Duncan (1992) found that children (grades 3-7) higher in perceived and actual physical competence perceived themselves to be more accepted by their peer group and were rated higher in peer acceptance by their teachers. Adolescents indicated that peer acceptance resulted in feelings of being a valued member of the team, increased effort, feelings of friendship, and less performance worries. On the other hand, a perceived lack of peer acceptance resulted in the exertion or withdrawing of effort, an emphasis on normative ability, and perceptions of inferior competence compared to other adolescents. These findings suggest that peer acceptance can influence the motivation and self-perceptions of children in the sport context (Vazou et al., 2005).

Peer relationships are particularly important to youth sport motivation. Perceived peer acceptance contributes to the enjoyment and perceived competence in combination with other social relationships, whereas friendship quality contributes to enjoyment, perceived competence, and self-determined motivation in combination with other social relationships (Ullrich-French & Smith, 2006).

*Friendship quality.*

Results from the friendship literature in sport contexts determined some of the dimensions of friendship. Weiss et al. (1996) extended the previous research on friendship support, and determined what positive dimensions of friendship are perceived by children and adolescents within the social context of sport. Through a descriptive and exploratory study, inductive content analysis generated 12 friendship dimensions: companionship, pleasant play/association, self-esteem enhancement, help and guidance, prosocial behaviour, intimacy, loyalty, things in common, attractive personal qualities, emotional support, absence of conflicts, and conflict resolution. Companionship was cited by the largest percentage of participants (95%) and was defined as “hanging out together, spending time together, and doing things together.” Self-esteem enhancement was expressed as saying or doing things to enhance one’s feelings of self-worth. This dimension was cited by 87% of the study sample. Providing instrumental assistance and tangible support defined the help and guidance dimension as mentioned by 79% of the sample.

Furthermore, the friendship literature also revealed that children and adolescents who perceived higher quality sport friendships were more likely to have positive affective responses toward their participation and motivation outcomes in physical activity (Weiss & Smith, 2002). For example, Weiss and Smith (2002) found that junior tennis players who regarded their best tennis friendships higher in similar beliefs and interests, companionship and pleasant play, and conflict resolution found their experiences more fun and pleasurable, and felt psychologically committed to continue their involvement in

tennis. On the other hand, those players who rated lower on those positive friendship dimensions reported lower enjoyment and desire to playing in the future.

Perceptions of both friendship and peer acceptance in physical activity settings can contribute to the formation of physical activity attitudes and behaviours in adolescents. Therefore, enhancing peer relationships in the physical activity setting is a practical approach in promoting active living among this population (Smith, 1999)

*Social support.*

Although the two broad areas of peer acceptance and quality of friendships in the context of sport make important contributions to our understanding of the youth physical activity experience, the examination of peer influences as they relate to support is necessary to obtain a comprehensive understanding of the determinants of physical activity among adolescents. The available research conducted in the physical activity domain has demonstrated the importance of peer and friend support in physical activity (Sallis et al., 1999; Saunders, Motl, Dowda, Dishman, & Pate, 2004; Anderssen & Wold, 1992; Wold & Anderssen, 1992; Allison et al., 2005; Patrick et al., 1999; Bungum & Vincent, 1997; Spink et al., 2006). The support of peers adds to the social integration, companionship, and friendship quality when adolescents participate in physical activity with their peers (Duncan et al., 2005).

Social support is positively related to youth physical activity with friends being the source of support most highly rated among adolescents. Adolescents who perceived greater support for physical activity from friends had higher levels of physical activity (Duncan et al., 2005). Other studies have found that companionship and esteem support provided by peers in physical education classes had an impact on the level of positive

affect related to physical activity, and expressed greater interest in activity participation outside of school among seventh- and eighth-grade students (Duncan, 1993). Greater perceptions of friendship in the physical activity domain were associated with more positive affect, indicating that friends influence an adolescent's attraction to sports and games, physical exertion, and vigorous exercise (Smith, 1999).

Having friends participate in physical activity and peer support were both identified as frequently occurring social correlates of activity participation (Spink et al., 2006). In particular, the level of physical activity of people significant in the lives of adolescents has been related to greater involvement in physical activity among adolescents. Peers are important role models who can influence adolescents' decisions to exercise regularly (Godin et al., 2005). Consistent with this finding, Wold and Anderssen (1992) conducted a survey on health behaviour in ten European countries (N=39,086). Three grades were included in the sample with mean ages of 11.5, 13.5, and 15.5 years. The survey was aimed at increasing the understanding of lifestyle and health behaviour and their context in the lives of young people. The findings indicated that significant others were important in influencing sport participation among children and adolescents. Children, whose parents, siblings, and best friends participated in sport were much more likely to take part in sport themselves when compared to children whose significant others were not involved in sport. The results also suggested that a stronger predictor of children's sport activity levels were dictated by sport participation of best friend than were sport participation levels of family members.

Moreover, detailed analyses indicated that the sport involvement of significant members of a child's social network was interconnected. This suggested that the social

networks of physically active children were dominated by persons who were themselves physically active. Therefore, as the number of sport-active persons within the network increased, the child's opportunities for observing and learning the roles of persons who are physically active also increased (Wold & Anderssen, 1992).

In another study, Anderssen and Wold (1992) examined the different ways parents and peers influenced leisure-time physical activity in young adolescents. The study included 904 seventh graders in western Norway (mean age 13.3 years) who took part in a health behaviour survey. The survey included questions regarding perceived leisure-time physical activity of parents and best friend; perceived direct support for physical activity from parents and friends; direct help from parents in exercising vigorously; and perceived value of physical activity of parents and friends. The findings as a whole supported the notion that significant others, through their behaviour and encouragement, exerted influence on participation. Having significant others who were physically active or who gave support were both influential. Significant others who were both physically active and supportive of adolescents' physical activity seem to have had an even larger impact.

Patrick et al. (1999) conducted semi-structured in-depth interviews with 41 adolescents (15 male, 26 female) in Grades 9, 10, and 12, who were talented in sports or the arts, and their parents in order to investigate: the role of peer relationships in adolescents' continued involvement in their talent activities; possible differences in this role by activity domain; and possible gender differences. The semi-structured, in-depth interviews raised discussion about each adolescent's involvement in his/her activity from childhood to adolescence. One of the most consistent themes raised involved the social

benefits that adolescents perceived, accumulated from their involvement in the talent activities. More than half of the participants indicated that involvement provided an opportunity to make friends, maintain a social support system, and come into contact with different peers, leading to an increase in the number of friends that they had. Adolescents also indicated that the social dimensions of their involvement were important to their commitment to their talent. In addition, over one-third of adolescents reported that the social aspects of peer relationships, such as being with their friends, enhanced their enjoyment of involvement, since it allowed them to spend more time with their friends.

Therefore, parents and peers may be seen as being important role models and important sources of reinforcement of physical activity in young adolescents. This is consistent with other studies that indicated that significant others were important in influencing sport participation among children and adolescents (Patrick et al., 1999; Wold & Anderssen, 1992; Anderssen & Wold, 1992).

Understanding gender differences related to peer social support and physical activity are also important in providing insight into the barriers and facilitators that exist for boys and girls. Trinh, Rhodes, and Ryan (in press) evaluated gender differences in physical activity beliefs related to intention and behaviour using the Theory of Planned Behaviour and found that boys reported school work and other plans and weather as barriers to participation, whereas girls revealed that lack of approval from friends was the key barrier to physical activity participation.

Findings from a focus-group study on boys revealed that boys engaged in physical activity to socialize, in order to spend and enjoy time with friends and meet new people

(Allison et al., 2005). Some perceived barriers to participating in physical activity included the influence of peers and family. Participants reported that their peers and family influenced their decision to be physically active or not. They indicated that if their friends or siblings did not engage in physical activity, they were less likely to be active, and that they became subjected to peer pressure when making decisions about physical activity (Allison et al., 2005).

Another study conducted on the role of peer social network factors and physical activity in adolescent girls revealed that adolescent girls who have more physically active friends report higher activity levels. The main finding was that frequency of activity with friends was the most significant independent predictor of girls' own activity (Voorhees et al., 2005). These gender difference findings among peer support and physical activity suggest that peer support is a more powerful influence on physical activity participation in girls compared to boys (Bungum & Vincent, 1997).

Not only does peer support enhance an adolescent's decision to become or stay physically active, peer interaction in physical activity settings is important to the socialization experiences involved. Such interaction produces either positive or negative affective responses, which either predispose adolescents to seek or avoid future involvement (Kunesh, Hasbrook, & Lewthwaite, 1992). It therefore appears that social support originating from peers has significant potential as a mechanism for effective activity-based interventions (Beets et al., 2006). However the mechanisms through which peer support operates remain elusive. Baker, Little and Brownell (2003) have called for more peer based research focusing on perceived norms of peers and the examination of relationships between these social referents as it relates to physical activity and gender.

### *The Theory of Planned Behaviour in the Physical Activity Domain*

The Theory of Planned Behaviour is one of the most extensively used theories in the physical activity domain (Symons Downs & Hausenblas, 2003) and provides a theoretical framework through which social support may be understood.

The Theory of Planned Behaviour (TPB) is a belief-based cognitive theory that indicates that an individual's intention to engage in a behaviour is the immediate proximal predictor of that behaviour. Intention is defined as the summary motivation to perform a behaviour (Ajzen, 1991). Furthermore, intention is theorized to mediate the influence of three main constructs on behaviour. The first determinant is attitude, which is an individual's belief about a behaviour influencing his/her way of thinking. The attitude construct includes both affective (e.g. it is enjoyable vs. un-enjoyable) and instrumental (e.g. it is harmful vs. beneficial) evaluations of performing the behaviour. The second determinant is subjective norm, which is motivation to comply with the wishes and desires of others. Subjective norm includes both injunctive (e.g. my social network thinks I should participate in physical activity) and descriptive (e.g. my social network will participate in physical activity). The third determinant influencing behaviour is perceived behavioural control, which is an evaluation of how easy or difficult it will be to adopt a behaviour (Ajzen, 1991).

According to the model, there are three types of beliefs that influence behaviour. First, behavioural beliefs are characterized by an individual's perceived positive and negative evaluation of a behaviour, and this causes them to form his/her attitude toward the behaviour (e.g. it is fun and enjoyable, but also time-consuming) (Ajzen, 2006). Second, normative beliefs are formed by an individual's perception that significant others

think s/he should engage in a behaviour, and they provide the framework for subjective norm (e.g. my friends think that I should engage in activity) (Ajzen, 2006). Third, control beliefs are established from an individual's perception that s/he has the necessary resources, skills, and power to engage in behaviour, and they formulate the structure for perceived behavioural control (e.g. physical activity may be easier to engage in if an individual has the ability and the skills) (Ajzen, 2006).

Various constructs of the Theory of Planned Behaviour has been applied to the physical activity domain, and studies have supported to use of the Theory of Planned Behaviour to predict and explain physical activity intention and behaviour (Symons Downs, Graham, Yang, Bargainnier, & Vasil, 2006; Baker, Little & Brownell 2003; Craig, Goldberg & Dietz, 1996; Godin et al., 2005; Hagger, Chatzisarantis & Biddle, 2001; Hagger, Chatzisarantis, Biddle & Orbell, 2001; Hagger, Chatzisarantis & Biddle, 2002; Kerner & Kurrant, 2003; Mummery, Spence & Hudec, 2000; Saunders et al., 2004; Trost et al., 2002; Trinh et al., in press). These studies examined the utility of Theory of Planned Behaviour constructs in predicting physical activity among adolescents. Overall, attitude and perceived behavioural control were significant predictors of intention to engage in physical activity behaviour, whereas subjective norms were not in both boys and girls (Hagger et al., 2001; Hagger et al., 2002; Trost et al., 2002).

The construct of subjective norm has not performed well in explaining physical activity intentions across studies when controlling for attitude and PBC. Given the poor performance of subjective norm in the adolescent literature, some researchers have suggested it may not be the most theoretically relevant social influence construct in the physical activity domain (Courneya, Plotnikoff, Hotz, & Birkett, 2000; Rhodes, Jones, &

Courneya, 2002). Moreover, these researchers have argued that social support may be a more appropriate social influence construct for understanding and predicting physical activity behaviour (Courneya et al., 2000; Rhodes et al, 2002). The conceptual distinction between subjective norm and social support is that subjective norm refers to the perceived pressure to perform a behaviour that comes from observing what significant others say or do. On the other hand, social support implies some sort of aid or assistance in performing a behaviour (Courneya et al., 2000; Rhodes et al, 2002). The theoretical argument as to why social support should be superior to subjective norm is due to physical activity behaviour not being under complete volitional control. For this behaviour, it is likely that assistance from others for performing the behaviour (e.g. social support) would be helpful beyond knowing that they approve of the behaviour. For behaviours under complete volitional control, subjective norm may be the most relevant social influence construct since a person only needs to know whether important others approve of the behaviour. By definition, they do not require any additional assistance. When individuals form an intention to engage in a behaviour, they rely more heavily on the amount of social support they anticipate than on the social norms they perceive(Courneya et al., 2000; Rhodes et al, 2002).

In order to address adolescents' long-term health, increase in physical activity levels should be focused on the promotion of lifelong physical activity habits (McKenzie, Marshall, Sallis, & Conway). TPB-based interventions will need to include strategies for creating supportive behaviours in addition to development of positive social norms in adolescents. This may help improve the prediction of physical activity intentions and

subsequent behaviour independent of interventions targeting the underlying beliefs that make up the TPB constructs of attitude, subjective norms, and PBC (Rhodes et al., 2000).

To date, there have been only two intervention studies and no research examining the role of social support that have used the Theory of Planned Behaviour within the adolescent population. Tsorbatzoudis (2005) tested the effectiveness of an intervention in manipulating the variables of the Theory of Planned Behaviour and exercise habits with 366 high school students (mean age of 14.2 years). The students were divided into intervention and control groups and the intervention lasted 12 weeks which included posters and lectures promoting participation in physical activity. The findings of this study revealed that the intervention was effective in improving attitudes toward physical activity, perceived behavioural control, intention and self-reported actual behaviour, but it was ineffective for improving attitude strength, subjective norms, and role identity.

In another intervention study conducted by Chatzisarantis and Hagger (2005), they examined two persuasive communications to assess the utility of an intervention based on the Theory of Planned Behaviour in promoting physical activity attitudes, intentions, and behaviour. A sample of 83 adolescents (mean age of 14.6 years old) were exposed to the persuasive communication that targeted modal salient behavioural beliefs (salient belief condition) and non-salient behavioural beliefs (non-salient behavioural belief condition). The findings indicated that adolescents who were presented with the persuasive message targeting modal salient behavioural beliefs reported more positive attitudes and stronger intentions than those presented with the message targeting non-salient behavioural beliefs. However, neither communication influenced physical activity

participation. This study was the first to reveal that it is possible to influence intentions by targeting attitudes only.

Implications of these study findings suggest that programs and interventions aimed at increasing the level of physical activity and sport among adolescents should consider targeting the cognitive, emotional, and behavioural components of attitude toward physical activity. One key aspect of targeting attitude toward physical activity is to consider the importance of social factors that influence behaviour. These programs should place an emphasis on forming friendships and peer interactions, and to encourage peers to participate in physical activity with other friends as important messages. It therefore appears social support originating from peers holds considerable potential as a mechanism for effective activity-based interventions.

## CHAPTER III

### Method

#### *Participants and Research Design*

A longitudinal descriptive study design was employed to examine the relationship between social support, physical activity levels, and adherence to a peer-based physical activity program among female adolescents, using the Theory of Planned Behaviour as an evaluation framework. Participants were recruited through presentations to 8 classes (N=200 students) at two local high schools within close proximity to the work-out facility and through a local recreation center with a teen drop-in program in Victoria, British Columbia to take part in the program. A sample of female adolescents (N=14) volunteered, this represents a response rate of 7%. The sample consisted of 11 active female adolescents and 3 previously inactive female students aged 13-17 years old, which corresponds to students in Grades 8, 9, 10, 11, and 12. Participation in this intervention study was on a voluntary basis. Prior to data collection, all participants received a student consent form (Appendix A), informed consent from a parent/guardian (Appendix B), and a PAR-Q form (Appendix M), which were completed and returned to the researcher.

#### *Setting*

All questionnaires and baseline and follow-up measures were administered and completed in a quiet classroom at the respective schools from where the students were recruited. The participants recruited from the Teen Lounge at the recreation centre completed the questionnaires in a quiet classroom at the University of Victoria. The 4-

week program sessions took place in the McKinnon weight room at the McKinnon Building at the University of Victoria.

#### *Dependent Variables*

The dependent variables in this study were physical activity levels as measured by the GLTEQ, adherence as measured by the number of sessions reported during the intervention phase, social support as measured by the Social Support Scale for Exercise Behaviours, and the Theory of Planned Behaviour constructs (attitude, subjective norm, perceived behavioural control, and intention).

#### *Independent/Categorical Variable*

The independent variable was the peer-based physical activity program, as measured by attending the session with a friend or alone.

#### *Instrumentation*

There were 9 major variables assessed in this study: physical activity behaviour, adherence to the peer-based program, social support, the main Theory of Planned Behaviour constructs (attitude, subjective norm, perceived behavioural control, and intention), and the barriers and facilitators related to physical activity participation in the peer-based program.

#### *Measurement of Physical Activity Behaviour*

Past and current exercise behaviour was assessed through an adaptation of the Godin Leisure Time Exercise Questionnaire (Godin & Shephard, 1985; Godin, Jobin, & Bouillon, 1986) (Appendix H). The instrument contained three open-ended questions examining the frequency of mild (e.g. easy walking), moderate (e.g. brisk walking), and strenuous (e.g. running) exercise completed during leisure time modified from one week

to a typical week over the last month. The duration of the intensities was established for at least 30 minutes. An independent evaluation of this instrument found it to be easily administered, brief and reliable, and to encompass concurrent validity based on various criteria including objective activity monitors and fitness indexes (Jacobs et al., 1993).

#### *Measurement of Adherence*

Adherence to the 4-week program was tracked through attendance at the physical activity program. Through the use of self-report, the participants filled out a physical activity tracking slip (at the end of every session) to indicate the date and duration of the exercise session as well as the type of activity performed (Appendix I). In addition, participants were asked to indicate whether they attended the exercise session with a friend or alone after each session.

#### *Measurement of Social Support*

Social support from peers was measured using a modified Social Support for Diet and Exercise Behaviours (Sallis, Grossman, Pinski, Patterson, & Nader, 1987) as it was most consistent with the definition of social support used in this study. The original scale exhibited evidence of factorial and construct validity among adolescents (Sallis et al., 1987). We modified the scale to include only the social support and exercise behaviour from friends questions as these best represented the definition of social support used in this study. The Social Support Scale for Exercise Behaviours included 13 statements rated on a 5-point Likert-type scale that ranged from 1=none to 5=very often (Appendix J).

*Measurement of the Theory of Planned Behaviour Constructs*

All questions relating to the direct measures of the Theory of Planned Behaviour were developed following the guidelines recommended by Ajzen (1991, 2002, 2006) (Appendix K).

Attitude towards physical activity was measured with six items using a 7-point semantic differential scaling. The affective component of attitude was measured with three items: (1) Doing regular physical activity over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely enjoyable to 7=extremely un-enjoyable, (2) Doing regular physical activity regular over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely boring to 7=extremely fun, and (3) Doing regular physical activity regular over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely unpleasant to 7=extremely pleasant. The instrumental component was measured with three items: (1) Doing regular physical activity over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely important to 7=extremely unimportant, (2) Doing regular physical activity over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely harmful to 7=extremely beneficial, and (3) Doing regular physical activity over the next 4 weeks would be, rated on a 7-point scale ranging from 1=extremely worthless to 7=extremely valuable.

Subjective norms towards physical activity were measured with five items using a 7-point Likert-type scale ranging from 1=strongly disagree to 7=strongly agree. The three injunctive norm items were: (1) Most people in my social network want me to be physically active over the next 4 weeks, (2) I feel pressure to engage in regular physical activity in the next 4 weeks from most people in my social network, and (3) Most people

in my social network will pressure me to engage in regular physical activity over the next 4 weeks. The two descriptive norm items were: (1) Most people in my social network will be physically active on a regular basis over the next 4 weeks, and (2) Most people in my social network will not be physically active on a regular basis over the next 4 weeks.

Perceived behavioural control over physical activity was measured with three items on a 7-point Likert-type scale based on anchors of 1 and 7. The three items were: (1) I could be physically active every day over the next 4 weeks if I really wanted to, ranging from a scale of 1=extremely easy and 7=extremely difficult, (2) How much control do you believe you have over engaging in regular physical activity over the next 4 weeks, ranging from a scale of 1=very little control to 7=complete control, and (3) There is very little I can do to make sure that I engage in regular physical activity over the next 4 weeks, ranging from a scale of 1=strongly disagree to 7=strongly agree.

Physical activity intention were measured with three items using a 7-point Likert-type scale ranging from 1=strongly disagree to 7=strongly agree. The three items were: (1) I plan to be physically active every day over the next 4 weeks, (2) I intend to be physically active every day over the next 4 weeks, and (3) I will try to be physically active every day over the next 4 weeks.

#### *Measurement of Barriers and Facilitators to Participation*

Two open-ended questions were administered at the end of the 4-week peer based physical activity program to elicit information about the factors that influenced participation. Participants were asked: 1) “What were some of the barriers that made it hard for you to participate in the physical activity program at the McKinnon Gym?” and “What were some factors that helped you participate in the physical activity program at

the McKinnon Gym?” Participants were also asked to write about their beliefs in the spaces provided under each question (Appendix L).

### *PAR-Q*

The PAR-Q form was used to assess the readiness of the participants involved in the study to participate in physical activity, and also to identify the individuals who needed to consult their doctor before participating in any physical activity (Appendix M). In addition, if the participants chose to bring a friend to their physical activity session, s/he had to fill out a form (available at the equipment desk in the McKinnon Building) and leave it with the facility attendant.

### *Procedures*

Ethical approval was obtained from the University of Victoria Human Research Ethics Board. Once permission was secured from the ethics board, the RecPlus co-ordinator at the University of Victoria was approached for approval to use the McKinnon weight room as the venue for the peer-based program (Appendix E). The Saanich District School Board (61) and the principals from the selected secondary schools were also approached for their approval to recruit participants in various classrooms associated with the target adolescent age group (Appendix C). The co-ordinator of the Teen Lounge at the recreation centre was also approached for permission to recruit participants for the study. At these presentations (Appendix F), the teacher/co-ordinator of the class was asked to step out of the classroom to ensure that students would not feel obligated to participate in the study. Interested participants were given student and parent consent forms to bring home, and they returned them to the researcher at the next meeting.

One week prior to the beginning of the program, a meeting was held with those students who had volunteered to participate in the study. The meeting was held at the respective secondary schools and the McKinnon Building (for those students recruited from the recreation centre) from where the participants were recruited. The purpose of the meeting was to explain the intent of the study, to gather baseline measures, and to learn safe and effective techniques for using the McKinnon weight room. The participants were given a standardized introduction to the questionnaires and pertinent definitions related to the study were provided by the researcher to ensure that the participants understood the requirements (Appendix G). Following these instructions, participants were asked to return the student and parent consent forms, sign the PAR-Q form, and proceed with completing the Physical Activity Beliefs and Intentions Questionnaire, the Social Support and Exercise Survey, and the Godin Leisure-Time Exercise Questionnaire.

To ensure confidentiality, student names were removed from the survey, and only numeric identifiers remained. The questionnaires were checked for completeness and incomplete questionnaires were returned to the participants to complete any missing information.

After the completion of the questionnaires, the participants were given a take-home training package that included handouts that ranged from sample training programs, directions to the McKinnon weight room, important dates/things to remember about the program, physical activity tracking sheet and the Physical Activity Guide for Youth for reference. The participants then learned safe and effective techniques to use the fitness equipment through demonstrations done by a certified personal trainer. At the

completion of the training session, each participant was given a one-month membership to McKinnon Gym to begin the program.

#### *Peer-Based Physical Activity Program*

The program ran for 4 weeks and each participant was given a complimentary membership to the McKinnon weight room to use the fitness equipment for the duration of the study. The one-month membership entitled participants to attend the gym as often as they wished, and allowed them to bring an additional non-member friend (male or female) to the gym. The participants had the option of either attending the 4-week program with friends or alone. All physical activity sessions were completed in the McKinnon weight room available free to students outside of normal class time. Students were asked to check-in with the facility attendant at the equipment desk in order to gain access to the fitness facility.

At the end of the 4-week program, all participants were re-tested on the Theory of Planned Behaviour constructs, social support provisions, and physical activity behaviour. They were also given two brief open-ended questions on the facilitators and barriers related to participating in the program.

#### *Data Entry and Analysis*

All quantitative data were entered into SPSS version 12.0 for analysis. Z-scores were computed with the study variables to determine and remove any outliers that were present. Descriptive statistics (mean and standard deviations) were computed for all the study variables. Relationships between the variables in the Theory of Planned Behaviour, social support, frequency of attending the program with and without friends, and physical activity behaviour were expressed as Pearson correlation coefficients at pre-program and

post-program measures. A paired sample t-test was used to determine whether there were differences in physical activity levels, the Theory of Planned Behaviour constructs, and social support pre and post-program.

The qualitative data were entered into Excel and content and thematic analysis was conducted using established qualitative research methods such as clustering and coding to identify emerging themes (Flick, 1998). After initial coding of the themes, the data and themes were reviewed again to identify any higher order themes that may be present.

## CHAPTER IV

### Results

#### *Descriptives.*

Data were collected from 14 adolescent girls (Mean age=15.08, SD=1.19; Mean grade 9.62, SD=1.26) recruited from two local secondary schools and a youth drop-in program in Victoria, British Columbia. Baseline data were gathered from all 14 participants, and post data were gathered from 13 participants as there was 1 drop-out in the study. Means and standard deviations for age, grade, TPB constructs, and the study variables for baseline measures and post-program are presented in Table 1. Eleven out of the 14 girls in the study were active (3 or more times a week of moderate-vigorous physical activity) at baseline, while 12 out of the 13 girls were active post-program. After the outliers were removed, the data from 13 participants were used at baseline and 12 students were used at post data collection.

#### *Quantitative data.*

Table 2 presents bivariate correlations between the peer-based physical activity program attendance, social support, physical activity behaviour (as measured by GLTEQ), and the Theory of Planned Behaviour constructs with the independent variables (frequency of attending the program with friends and without friends) in the study for both baseline and follow-up. Of primary interest, the baseline social support score ( $r=0.37$ ,  $p<.05$ ) was not a significant correlate of physical activity behaviour at baseline among adolescent girls. Of the TPB constructs at baseline, subjective norm ( $r=0.58$ ,  $p<.05$ ) was positively correlated with social support, while attitude ( $r=-0.24$ ,  $p>.05$ ), PBC ( $r=0.13$ ,  $p>.05$ ), and intention ( $r=-0.22$ ,  $p>.05$ ) were not significantly correlated. The

TPB constructs of attitude, subjective norm, PBC, and intention were also not significantly correlated with physical activity behaviour ( $p > .05$ ).

At post-program, physical activity behaviour ( $r = 0.33$ ,  $p > .05$ ) was not a significant correlate of attendance to the peer-based physical activity program by the adolescent girls. The frequency of attending the peer-based physical activity program with friends ( $r = 0.97$ ,  $p < .01$ ) was positively correlated with program attendance. Of the nine participants that adhered to the program, only one ever came without a friend. Similar to baseline, the post-program social support score ( $r = 0.29$ ,  $p < .05$ ) was not a significant correlate of physical activity behaviour. Attendance and the frequency of attending the program with and without friends was also not significantly correlated with social support and physical activity behaviour at post-program ( $p > .05$ ). Among the TPB constructs at post-program, no TPB constructs were significant correlates of program attendance and physical activity behaviour ( $p < .05$ ). However, PBC ( $r = -0.82$ ,  $p < .01$ ) was negatively correlated with social support post-program. All other TPB constructs of attitude, subjective norm, and intention were not significantly correlated with social support post-program ( $p < .05$ ).

Paired samples t-tests were used to determine if there were differences between baseline and post-program measures and are presented in Table 3. Of key interest, there were no significant differences between the PA score, social support score, attitude, subjective norm, PBC, and intention at baseline and post-program measures.

Linear regression analyses were conducted for the prediction of attendance to the peer-based physical activity program and are presented in Table 4. Sixty-six percent of the variability in attendance can be accounted for by the variability in the five predictor

variables considered together. However, none of the predictor variables for program attendance were significant.

Table 1

*Means and Standard Deviations for Age, Grade, TPB Constructs, Social Support, Physical Activity Score, and Attendance in Adolescent Girls for Baseline (N=13) and Post-Program (N=12)*

Variables	Baseline		Post-Program	
	Mean	SD	Mean	SD
Age	15.08	1.19		
Grade	9.62	1.26		
GLTEQ Score	52.46	23.04	54.92	18.94
Social Support	28.50	6.01	25.25	8.91
<u>TPB Constructs</u>				
Attitude	36.58	4.19	32.25	7.20
Subjective Norm	21.08	3.92	23.08	5.18
PBC	11.58	2.54	12.08	2.35
Intention	17.08	2.91	15.25	4.52
Freq. with Friends			2.08	2.10
Freq. w/o Friends			0.15	0.56
Attendance			2.23	2.32

Table 2

*Bivariate Correlations Between Potential Correlates and TPB Constructs in Attendance, Social Support and Physical Activity (PA) Behaviour with Adolescent Girls*

Variables	Baseline			Post-Program		
	Attendance	Social Support	PA Behaviour	Attendance	Social Support	PA Behaviour
PA Behaviour		0.37		0.33	0.29	
Attendance					0.52	0.32
Freq. with Friends				0.97**	0.58	0.40
Freq. w/o Friends				0.49	-0.01	-0.18
<u>TPB Constructs</u>						
Attitude		-0.24	0.45	0.11	0.22	0.08
Subjective Norm		0.58*	0.40	0.41	0.54	0.06
PBC		0.13	-0.19	-0.34	-0.82**	-0.13
Intention		-0.22	0.19	0.20	0.52	-0.08

Note: \*\*p<0.01, \*p<0.05, two-tailed.

Table 3

*Paired-Sample T-test for Comparison Between Baseline (N=13) and Post-Program (N=12) Measures with Adolescent Girls*

Variables	Mean	SD	t	df
Pre PA Score—Post PA Score	-3.83	21.57	-0.62	11
Pre Social Support Score—Post Social Support Score	3.25	6.69	1.68	11
Pre Attitude—Post Attitude	4.33	7.83	1.92	11
Pre Subjective Norm—Post Subjective Norm	-2.00	6.37	-1.09	11
Pre PBC—Post PBC	-0.50	3.87	-0.45	11
Pre Intention—Post Intention	1.83	4.76	1.33	11

Note: \*\*p<0.01, \*p<0.05, two-tailed.

Table 4

*Linear Regression Analyses for the Prediction of Attendance to the Peer-Based Physical Activity Program among Adolescent Girls (N=12)*

Variables (Post-Program)	F	df	R <sup>2</sup>	b	β
	1.63	6	0.66		
GLTEQ score				0.01	0.05
Social Support				0.34	0.17
<u>TPB Constructs</u>					
Attitude				-0.44	-1.37
Subjective Norm				0.76	0.72
Perceived Behavioural Control				1.32	1.34
Intention				-0.32	1.32

Note: \*\*p<0.01, \*p<0.05, two-tailed

*Qualitative data.*

The facilitators that emerged as important to the adolescent girls in participating in the peer-based physical activity program are presented in Table 5. Participant quotes supporting each theme are also displayed in Table 5. The majority of the participants mentioned friends as a perceived facilitator that was a product of the socialization and encouragement aspect of physical activity (e.g. to hang out with friends). Many of the participants also mentioned that physical benefits such as wanting to be healthy and wanting to stay in shape as important facilitators for participation in the program. The facility where the physical activity program took place was also important in that the uncrowded gym was attractive to many of the participants in the study. Weather and preferential activity were mentioned as an important facilitator, but were less important than the other themes identified.

The barriers that emerged as important to the adolescent girls in participating in the peer-based physical activity program are presented in Table 6. Participant quotes supporting each theme are also included in Table 6. Participants highlighted that the hours of operation of the gym and the variety of equipment available was a barrier to the participation in the program. Not having enough variety in the exercise equipment and the early closure of the facility was a major barrier. In addition, distance and lack of time was also another major barrier for many of the participants, where some stated that the gym was inconvenient to get to, while others stated that they had other work and school related duties to attend to. Motivation was another theme that emerged as a barrier to the participation in the program, but appeared less important than the other themes identified.

Table 5

*Perceived Facilitators Identified by Adolescent Girls in the Participation of the Peer-Based Physical Activity Program*

Major themes	Number of text comments	Sub-themes	Comments
Friends	4	Socializing	“Time to hang out with friends.”
	2	Encouragement	“Friends encouragement.” “If my friend wanted to go.” “My friends suggested to go.” “Motivated by friends.”
Physical Benefits	2	Appearance	“I wanted to get in better shape and look better.” “Want to slim down for the summer.”
	1	Physical Performance	“I also wanted to have good endurance [for tennis].”
	2	Health Benefits	“Wanna stay healthy.” “Trying to be healthy.” “Wanting to get fit.”
Preferential Activity	2	Best available option	“It fit my schedule.” “Had nothing to do.”
Facility	3	Uncrowded Gym	“Not many people were around.” “Usually quiet and not very busy when we were there.”

	1	University	“Just being at UVic and part of a study.”
	2	Free Admission	“Free admission to the gym.”
Weather	2	Nice weather	“Nice weather (could walk there).” “Sunny weather.”

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Table 6

*Perceived Barriers Identified by Adolescent Girls in the Participation of the Peer-Based Physical Activity Program*

Major themes	Number of text comments	Sub-themes	Comments
Facility	4	Hours of Operation	<p>“The gym closed at 7, and I normally exercise during 8:45 and 9:30pm.”</p> <p>“It closed too soon and it doesn’t open on weekends.”</p>
	4	Variety of Equipment	<p>“Not enough equipment.”</p> <p>“McKinnon gym is not as good as Gordon Head [in terms of equipment].”</p> <p>“Gym wasn’t that great.”</p> <p>“Gym was too small and not a variety of machines.”</p>
Physical Constraint	4	Distance	<p>“I wasn’t able to get to the gym because it’s a little far away.”</p> <p>“It was inconvenient to get there.”</p>
Lack of Time	5	School and Work-Related Duties, Sport Practices	<p>“I couldn’t do that for a number of reasons: work and school study.”</p> <p>“Homework and busy schedule.”</p> <p>“Couldn’t go a few times because of another sport’s practice.”</p> <p>“Other life events (i.e. babysitting).”</p>

Motivation level

2

Low motivation

“Simply too lazy.”  
“Not feeling like it.”

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## CHAPTER V

### Discussion

The main purpose of this study was to examine the relationship between social support, physical activity levels and adherence to a peer-based physical activity program among adolescent girls, using the Theory of Planned Behaviour as an evaluation framework. The study also examined some of the barriers and facilitators that were involved in participating in the peer-based physical activity program at the post-program measure. The findings of this study should be interpreted in light of a number of limitations. Firstly, this study was severely underpowered for many statistical tests. Many difficulties were encountered by the researcher which prevented gathering enough participants for the study. Specifically, there were recruitment issues at the school and student level. In the two schools that were willing to participate response rates were extremely low despite regular daily announcements made about the nature of the study during the morning, lunch, and after-school one week prior to the start of the study. In addition to announcements being made, the researcher went into various classes (with prior permission of the instructor) to give a recruitment presentation on the nature of the study and handed out information and consent forms to eligible participants.

Since the peer-based physical activity program involved a 4-week commitment to the study, possible explanations for the low response rates may be due to the lack of time, which is a commonly cited barrier among adolescent girls to participate in physical activity (Dwyer et al., 2006). Also, the study took place in the months of April-June, which may represent a period where students are busy preparing for exams, finishing up courses, and/or entering closing season for many sport teams. Another explanation for

the lack of interest in participating in this study may be due to their level of interest and motivation for physical activity may already be deteriorating, since there is a decrease in physical levels with increasing age (Robbins et al., 2003). Several attempts made by the researcher to increase the sample size for the study by adding other schools were not successful.

Although bivariate correlations were conducted on the study variables, cause and effect could not be determined. Though there were some significant correlations found among the study variables, the small sample may have hidden further relationships.

Secondly, the sample used in this study was a convenience sample. The secondary schools as well as the drop-in teen program involved were chosen based on their close proximity to the gym facility where the peer-based physical activity program took place. In addition, the secondary schools involved were subject to school board and principal approval. And even once approval has been granted, individual instructors for each class in the school had to be contacted for permission to give recruitment presentations. In addition, participants were not randomly chosen because their participation in the study was voluntary and subject to parental approval. Since the sampling frame was from one geographical region of Southern Vancouver Island and involved school-based adolescents, it may not generalize to other regions or adolescents outside of the school system or from a broad range of backgrounds.

Thirdly, the current study relied on self-report measures of the study variables which may be open to reporting bias, measurement error, and substantial inconsistencies (Duncan, 1993; Sallis et al, 2000; Armstrong & Welsman, 2006; Duncan et al., 2005; Spink et al., 2006; Anderssen & Wold, 1992). Since retrospective, self-report measures

were used in this study, there are considerable demands placed on one's cognitive abilities to recall specific events in the past. The events recalled may be memories of the behaviour of interest that have decayed, been filtered through perceptions and biases, and have been affected by competing memories, social desirability, and misunderstanding of instructions (Armstrong & Welsman, 2006; Harrell et al., 2003). In addition, with self-report measures physical activity is typically over reported, reflecting inflated estimates of true activity levels (Beets et al., 2006). The idea that the adolescent girls involved in this study may provide a socially desirable response to the self-report measures cannot be ruled out. The adolescent girls may have included responses that they felt to be most appropriate to the researcher. Improved assessments of physical activity, especially among adolescents are needed using objective measures of physical activity (e.g. accelerometry, pedometry, direct observation). Future research should consider combining the use of self-report and objective measures of physical activity to more accurately assess levels of physical activity in adolescents.

Fourthly, the duration of the peer-based physical activity program may have been too short to observe differences in adherence levels among the adolescent girls. And lastly, a sampling bias was present as the initial intent of this study was to recruit inactive adolescent girls. However, the low response rate led to the recruitment of both inactive and active adolescent girls.

To date only one study has included the role of peer social network factors on physical activity in adolescent girls. The study was cross-sectional in nature and indicated that the frequency of physical activity with friends was an important correlate of physical activity among peer network variables for adolescent girls (Voorhees et al., 2005). In

addition, no study to date has examined the relationship between physical activity levels and adherence to peer-based physical activity programs using the Theory of Planned Behaviour as an evaluation tool. The findings from this study provide preliminary evidence of the nature of this relationship further advancing the literature in this area.

The frequency that program participants attended accompanied by friends was a significant correlate of program attendance, which supports our first hypothesis. It should be noted that there was a considerable overlap (high collinearity) between attendance and the frequency of attending with a friend and without. The peer-based physical activity program measured attendance to the program by examining the frequency of either attending with a friend or alone. Only one out of the 9 participants who did attend ever came to the program without a friend and thus the data was skewed.

The significant correlation between the frequency of attending the program with friends and the attendance to the program is consistent with previous cross-sectional research that indicated that girls who participated in activities with their peers reported more activity than those who indicated less peer activity involvement (Voorhees et al., 2005). This is also consistent with prior research on social support and physical activity among adolescents, where the strongest and most consistent factors associated with change in physical activity among adolescent girls are support for physical activity from peers. Friend support has previously been shown to be an especially strong relationship in physical activity among adolescent girls (Neumark-Sztainer et al., 2003; Bungum & Vincent, 1997). These findings also support the work of Wold and Anderson (1992) and Spink et al. (2006) who found that, adolescents whose best friends take part in sport are

much more likely to take part in sport themselves compared with adolescents whose significant others are not involved in sport.

These results highlight the impact of peers on adherence to a physical activity program, but also show that the peer-based program and social support did not actually contribute to overall physical activity levels or to change in those levels. Most of the girls in the study were already active and this result may reflect a ceiling effect or that this program replaced other modes of activity that the girls were previously engaged in. Prior research on social support and physical activity among adolescents has demonstrated that the strongest and most consistent factor associated with change in physical activity levels among adolescent girls was support for physical activity from peers (Neumark-Sztainer et al., 2003; Bungum & Vincent, 1997). However, this research did not demonstrate this relationship.

Social support was not significantly correlated with girls' physical activity levels at baseline, which did not support our second hypothesis. Our results were also not consistent with prior research (Saxena et al., 2002; Dwyer et al., 2006; Duncan et al., 2005; Beets et al., 2007; Anderssen & Wold, 1992; Bungum & Vincent, 1997; Neumark-Sztainer et al., 2003, Voorhees et al., 2005). Prior to the study, they may not have had access to a physical activity program that encouraged them to participate with friends. Lack of interest from friends in being active and the absence of people to be active has been shown to be a deterrent for adolescents participating in physical activity (Hohepa, Schofield, & Kolt, 2005; Dwyer et al., 2006).

Social support was also not a significant correlate of girls' physical activity levels at the post-program measure, which was also not consistent with prior research (Saxena

et al., 2002; Dwyer et al., 2006; Duncan et al., 2005; Beets et al., 2007; Anderssen & Wold, 1992; Bungum & Vincent, 1997; Neumark-Sztainer et al., 2003, Voorhees et al., 2005). For example, Voorhees et al. (2005) found peer involvement in participating in a class or on a sports team with a friend, having a friend ask you to be active, and asking the friend to be active with you, were all positively related with increased physical activity levels. Similarly, important motivators for physical activity involvement for adolescent girls are having the social support and positive encouragement from friends (Robbins, Pender & Kazanis, 2003; Hohepa et al., 2006; Anderssen & Wold, 1992). Despite the strong relationship between social support and physical activity levels shown in many studies, our results did not reflect this relationship. However, when examining the coefficient of determination ( $r^2$ ) between social support and physical activity levels in this study, the results indicated a small effect size which was similar to other studies that have shown a significant relationship (Rhodes et al., 2002; Courneya et al., 2000).

It should be noted that previous literature that showed a relationship between social support and physical activity levels applied different methodologies compared to the ones used in our study. The majority of the studies either employed a cross-sectional study design with the use of self-reported survey items to assess the study variables (Beets et al., 2007; Voorhees et al., 2005; Saxena et al., 2002; Anderssen & Wold, 1992; Bungum & Vincent, 1997); a longitudinal cohort-sequential design (Duncan et al., 2005); a descriptive study (Robbins et al., 2003); a physical education program for obesity prevention (Neumark-Sztainer, 2003); or the use of focus groups (Hohepa et al., 2005; Dwyer et al., 2006). Also, these studies did not specifically examine social support in the context of peers nor was the sample limited to the study of girls. Rather, these studies

assessed other variables including perceived barriers to participation and determinants of physical activity. Even when studies examined the role of social support in physical activity among adolescents, they employed different study designs and measurements protocols than the ones used in our study. Specifically, our study employed a longitudinal descriptive study design with the use of self-reported survey items and a peer-based physical activity program. We also delimited the sample to adolescent girls.

Another possible explanation for the inconsistent findings in our study could be the small sample and consequent lack of statistical power. Previous literature supporting the relationship between social support and physical activity levels had samples between 77 and 904 participants for cross-sectional, longitudinal and descriptive studies (Beets et al., 2007; Voorhees et al., 2005; Saxena et al., 2002; Anderssen & Wold, 1992; Bungum & Vincent, 1997; Duncan et al., 2005; Robbins et al., 2003; Neumark-Sztainer, 2003). Finally, the effect size relationships between social support and physical activity levels that are found in the literature are from studies conducted on adults rather than adolescents, which may limit the comparability of the findings (Rhodes et al., 2002; Courneya et al., 2000).

Interestingly, social support was also not a significant correlate of program attendance and frequency of program attendance with peers. No study to date has looked at the relationship between program attendance and social support employing a peer-based physical activity program and thus this is unique to our study. Since it has been shown in prior research that support from peers is a powerful predictor of physical activity among adolescent girls (Neumark-Sztainer et al., 2003; Bungum & Vincent, 1997), a positive relationship between social support and program attendance and

frequency of program attendance with peers could be expected. This relationship was not present in our findings. This may be due to lack of interest by the participant's peers to participate in this program with them. Also, the majority of the girls in this study has been previously active and may not have required the support of their peers to participate in the program. These previously active girls may already have in place a schedule for daily physical activity and will follow their schedule despite not choosing to attend the program with friends.

Of the Theory of Planned Behaviour constructs, subjective norm was a significant correlate of social support for the adolescent girls at baseline but not at post-program, which is in partial support of hypothesis 3. It is not surprising that subjective norm was a significant correlate of social support at baseline, since social support was measured using a modified version of Sallis' Social Support for Diet and Exercise Behaviours Survey (1987) that examined peer referents only. Since subjective norm looks at the evaluation of the perceived approval from others to perform a behaviour, adolescent girls in this study were likely to seek the approval of their peers when deciding to engage in physical activity. Previous research has shown that adolescents who had positive encouragement from friends, and whose friends take part in sport are much more likely to take part in sport themselves compared with adolescents whose significant others are not involved in sport (Wold & Anderssen, 1992; Spink et al., 2006; Robbins, Pender & Kazanis, 2003; Hohepa et al., 2006; Anderssen & Wold, 1992).

In our study, friends were seen as an important source of approval for physical activity participation among adolescent girls at baseline, but not at post-program. This is consistent with previous research on social support and the Theory of Planned Behavior.

Physical activity is not a completely volitional behaviour, and thus supportive behaviours beyond normative influences should be important for engaging in and performing exercise (Courneya et al., 2000). When individuals form an intention to engage in physical activity, they rely more on the amount of social support they anticipate than on the social norms they perceive (Courneya et al., 2000). It should be noted that the study conducted by Courneya and his colleagues used a community sample of adults rather than adolescents girls, and thus comparability with our study may be limited. More research needs to be conducted in the area of social support and TPB in the physical activity domain, especially with an adolescent sample.

Furthermore, subjective norm was not a significant correlate of physical activity levels and program attendance at baseline or post-program. Seeking peer approval to participate in physical activity may not be as important as having the social support from peers, such as attending the program with peers. This may explain why a relationship between subjective norm and physical activity levels and program attendance was not seen. Prior research by Rhodes et al. (2002) found that physical activity behaviour is influenced by assistance from others (e.g. social support) rather than subjective norm. That is, for those behaviours under complete volitional control, subjective norm may be the most relevant social influence construct because for these behaviours, one only needs to know whether or not there is approval from significant others. Thus, they do not require any assistance. However, for behaviours such as physical activity, that are not completely volitional, it is likely social support for performing the behaviour would be beneficial beyond knowing that significant others approve of the behaviour. Nevertheless, Rhodes et al. (2002) used a sample of undergraduate students who completed self-report

measures of the study variables, whereas we used a sample of adolescent girls with a peer-based physical activity program. Though the study characteristics differed, the observation that social support may be a more important influence on intention to engage in physical activity behaviour than subjective norm is a fairly robust finding.

Although the results for subjective norm were not statistically significant, a closer look at effect sizes revealed an effect size (small) similar to other TPB studies conducted on adolescents (Symons Downs et al., 2006; Baker et al., 2003; Craig et al., 1996; Godin et al., 2005; Hagger et al., 2001; Hagger et al., 2002; Kerner & Kurrant, 2003; Mummery et al., 2000; Saunders et al., 2004; Trost et al., 2002). Similarly, attitude was also not a significant correlate of physical activity behaviour, but the effect size was similar to other study findings (Symons Downs et al., 2006; Baker et al., 2003; Craig et al., 1996; Godin et al., 2005; Hagger et al., 2001; Hagger et al., 2002; Kerner & Kurrant, 2003; Mummery et al., 2000; Saunders et al., 2004; Trost et al., 2002).

An unexpected finding of this study was that perceived behavioural control was negatively correlated with social support. This relationship generated a large effect size which was similar to other study findings (Courneya et al., 2000; Rhodes et al., 2002). This unexpected finding may be interpreted as adolescent girls in this study who had less perceived capability to overcome barriers and difficulties associated with physical activity required more social support. These findings suggest that peers not only provide an additional incentive and/or motivation that allow adolescent girls to overcome barriers, but also that peers are a source of social influence that can be sought to be active with in activities. This influence then allows them to be active even when situations may not be favourable for activity involvement. This is consistent with previous research where

Beets, Pitetti, and Forlaw (2007) found that having peers that promote physical activity involvement and asking one's peers to be active with are related to efficacious perceptions of one's ability to overcome potential barriers (e.g. feelings of tiredness, poor weather conditions, homework demands, busy schedule) for engaging in physical activity.

When the adolescent girls in this study were asked about the facilitators and barriers to their involvement in the peer-based physical activity program, it yielded some interesting findings. Many of them indicated friends to be a major facilitator in their participation in the program. Being able to spend time with friends and encouragement from friends facilitated in attendance at the physical activity program. Consistent with the findings of others, Allison et al. (1999) found the desire for social engagement and the desire to spend time with their peers was a significant factor influencing adolescents' continued involvement in sport. Similarly, Voorhees et al. (2005) found peer involvement in doing activity with, participating in a class or on a sports team with a friend, having a friend ask you to be active, and asking the friend to be active with you, were all positively related with increased physical activity levels.

Some of the other facilitators that the girls mentioned as influencing their participation in the program were the physical benefits acquired from physical activity, that the program was the best option available, and the nature of the facility. This is also consistent with previous research where the correlates of physical activity among adolescents were found to be associated with the physical benefits such as appearance, physical performance, and health benefits (Hohepa et al., 2006). Furthermore, the peer-based program was seen as the best option available when the girls had nothing else to do. The program was free of charge to all of the participants and to their guests, and they

could attend the program as often as they wished. This is consistent with previous research where Hohepa et al. (2006) found that physical activity was considered an option among adolescents when there was nothing else to do. Also, the nature of the facility used for the peer-based program was also a facilitator for participation in the program. Our program took place in the McKinnon weight room where there was availability of different aerobic and resistance training equipment, as well as exercise mats for stretching and abdominal work. This is consistent with research on the environmental correlates of physical activity. Spink et al. (2006) identified that the availability of the activity setting and opportunities to be active were important correlates for engaging in physical activity.

In contrast, although there were facilitators that influenced the girls' participation in this study, there were also barriers that were noted. Many of the girls indicated that inaccessibility to the facility (e.g. hours of operation, variety of equipment, distance), lack of time (e.g. other responsibilities), and motivational level (e.g. low motivation) were major barriers to their participation. The McKinnon weight room was only open to the girls from Monday to Fridays from 7:00 am to 6:00pm, and was closed on weekends. All of the girls in this study were full-time students at their respective secondary schools, and thus it did not give them adequate travel and workout time at the gym. Also, the weight room is a small room at the University of Victoria with limited aerobic and resistance training equipment, some of which were outdated. Moreover, some of the girls in our study did not live within close proximity to the McKinnon weight room, making traveling to the program inconvenient. Some girls identified having other responsibilities such as homework, a part-time job, and family duties to attend to, while

others mentioned that they could not engage in physical activity because they considered school and homework to be of higher priority. Levels of motivation were also seen as a barrier for these adolescent girls as many reported that they were too lazy to engage in physical activity or their part-time work left little time for physical activity because they felt too tired to do anything else.

The qualitative findings were more consistent with previous research compared to the quantitative findings. Lack of time was identified as one of the main barriers in participating in physical activity (Robbins et al., 2003; Saxena et al., 2002; Dwyer et al., 2006). Dwyer et al. (2006) explored the perceived barriers to participation of physical activity among adolescent girls and found similar barriers to activity as our study. Inaccessibility of facilities was mentioned as a barrier (Dwyer, et al, 2006). Motivational levels were another barrier identified by adolescents in the peer-based physical activity program. Feelings of laziness and “not feeling like it” were cited as barriers to exercise among girls, which is consistent with previous research where adolescents reported low motivation levels (e.g. “can’t be bothered”) and laziness as common perceived barriers to exercise (Saxena et al., 2002; Hohepa et al., 2006).

Despite the qualitative findings we didn’t find a relationship between attending with or without a peer and changes in physical activity. This is not in alignment with the literature to date. In addition there were no variables that significantly predicted attendance at the peer-based physical activity program. The paired-sample t-test comparing baseline and post-program measures also found no significant differences in physical activity levels, even with the peer-based physical activity program. This is inconsistent with previous literature where the strongest predictors of increased physical

activity levels among adolescent girls were the involvement of peers in the activity and social support from friends (Saxena et al., 2002; Dwyer et al., 2006; Duncan et al., 2005; Beets et al., 2007; Anderssen & Wold, 1992; Bungum & Vincent, 1997; Neumark-Sztainer et al., 2003, Voorhees et al., 2005). This may be a consequence of the previously described study limitations.

Despite the limitations, there were a number of important methodological and conceptual strengths to the study. Firstly, the study incorporated both quantitative and qualitative methods (e.g. open-ended questions) to identify possible factors that could potentially improve our understanding of peer relationships and physical activity among adolescent girls. Since the sample size was too small to determine other possible relationships between the study variables that could have been missed, the open-ended questions at the post-program measure proved useful. The responses from these questions were able to identify some of the facilitators and barriers related to the participation in the peer-based physical activity program.

Secondly, it is suggested that longitudinal studies be employed to confirm cross-sectional findings on social support and physical activity among adolescents (Bungum & Vincent, 2000; Bungum et al., 1997). The current study employs a prospective longitudinal design that examines whether or not a 4-week peer-based physical activity program increases the physical activity levels of adolescent girls through adherence.

Thirdly, it has also been suggested that interventions and physical activity programs utilize the promotion of the physical activity-related assistance provided by peers and target peer involvement in these activities (Beets et al., 2006; Beets et al., 2007). Since hanging out with friends is important at this age, the development and

implementation of physical activity programs that encourage adolescents to drop in with their friends and participate has been suggested (Dwyer et al., 2006). The current study employs a peer-based physical activity program which placed an emphasis on attending physical activity sessions with friends. Peers were selected as a factor for the program based on the predictors of participation in physical activity generated by previous research in the area.

Finally, the evaluation of the peer-based physical activity program on the physical activity levels of adolescent girls was done through a sound theoretical framework of the Theory of Planned Behaviour, which is one of the most extensively used theories in the physical activity domain for understanding, explaining, and predicting physical activity.

This study extends the literature on peer relationships and physical activity among adolescents through understanding peer-based approaches to physical activity participation. Prior research on peer relationships and physical activity had either employed: 1) measures of social support with no specific emphasis on friends (Anderssen & Wold, 1992; Wold & Anderssen, 1992; Duncan et al., 2005), 2) non-peer-based physical activity interventions (Neumark-Sztainer et al., 2003; Tsorbatzoudis, 2005), or 3) cross-sectional research designs (Voorhees et al., 2005). The current study also provides preliminary support for the claim that a physical activity program targeting peer social support may serve as a viable mechanism for increasing physical activity levels in adolescent girls. Because of the importance of peer relationships during adolescence, programs should be designed to include opportunities for peer support and participation in their content. This is of particular importance for adolescent girls whose participation in physical activity is low and decreases with age (Bungum et al., 2000). The current

results suggest that a supportive social environment will make it easier for adolescent girls to engage in physical activity.

Future studies should employ experimental designs and incorporate a larger sample in order to confirm cross-sectional findings on social support and physical activity among adolescent girls. Future studies should also examine peer-based physical activity programs with both active and inactive girls, urban and rural youth, youth from different cultural backgrounds and compare structured and unstructured physical activity opportunities in order to gain a more comprehensive picture.

## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). *Constructing a TPB questionnaire: Conceptual and methodological considerations*. Retrieved September 10, 2006, from <http://www-unix.oit.umass.edu/%7Eaizen/tpb.html>
- Ajzen, I. (2006). *Behavioural interventions based on the theory of planned behavior*. Retrieved September 10, 2006, from <http://www-unix.oit.umass.edu/~aizen/pdf/tpb.intervention.pdf>
- Allison, K.R., Dwyer, J.J.M., Goldenberg, E., Fein, A., Yoshida, K.K., & Boutilier, M. (2005). Male adolescents' reasons for participation in physical activity, barriers to participation, and suggestions for increasing participation. *Adolescence*, 40(157), 155-170.
- Anderssen, N., & Wold, B. (1992). Parental and peer influences on leisure-time physical activity in young adolescents. *Research Quarterly for Exercise and Sport*, 63(4), 341-348.
- Armstrong, N., & Welsman, J.R. (2006). The physical activity patterns of European youth with reference to methods of assessment. *Sports Medicine*, 36(12), 1067-1086.
- Baker, C.W., Little, T.D., & Brownell, K.D. (2003). Predicting adolescent eating and activity behaviors: The role of social norms and personal agency. *Health Psychology*, 22(2), 189-198.

- Beets, M.W., Pitetti, K.H., & Forlaw, L. (2007). The role of self-efficacy and referent specific social support in promoting rural adolescent girls' physical activity. *American Journal of Health Behavior, 31*(3), 227-237.
- Beets, M.W., Vogel, R., Forlaw, L., Pitetti, K.H., & Cardinal, B.J. (2006). Social support and youth physical activity: The role of provider and type. *American Journal of Health Behavior, 30*(3), 278-289.
- Berndt, T.J. (1982). The features and effects of friendship in early adolescence. *Child Development, 53*, 1447-1460.
- Berndt, T.J., & Perry, B. (1986). Children's perceptions of friendships as supportive relationships. *Developmental Psychology, 5*, 640-648.
- Biddle, S.J.H., & Nigg, C.R. (2000). Theories of exercise behavior. *International Journal of Sport Psychology, 31*, 290-304.
- Bungum, T., Dowda, M., Weston, A., Trost, S.G., & Pate, R.R. (2000). Correlates of physical activity in male and female youth. *Pediatric Exercise Science, 12*, 71-79.
- Bungum, T.J., & Vincent, M.L. (1997). Determinants of physical activity among female adolescents. *American Journal of Preventive Medicine, 13*(2), 115-122.
- Bukowski, W.M., & Hoza, B. (1989). Popularity and friendship: Issues in theory, measurement, and outcome. In T.J. Berndt & G.W. Ladd (Eds.), *Peer relationships in child development* (pp.15-45). New York: Wiley.
- Casperson, C.J., Powell, K.E., & Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: Definition and distinctions for healthy-related research. *Public Health Reports, 100*, 126-131.
- CFLRI. (2004). *2004 Physical Activity Monitor*. Retrieved September 10, 2006 from

<http://www.cflri.ca/eng/statistics/surveys/pam2004.php>

- Chatzisarantis, N.L.D., & Hagger, M.S. (2005). Effects of a brief intervention based on the theory of planned behavior on leisure-time physical activity participation. *Journal of Sport & Exercise Psychology, 27*, 470-487.
- Clark-Lempers, D.S., Lempers, J.D., and Ho, C. (1991). Early, middle, and late adolescents' perceptions of their relationships with significant others. *Journal of Adolescent Research, 6*, 296-315.
- Courneya, K.S., Plotnikoff, R.C., Hotz, S.B., & Birkett, N.J. (2000). Social support and the theory of planned behavior in the exercise domain. *American Journal of Health Behavior, 24*(4), 300-308.
- Craig, S., Goldberg, J., & Dietz, W.H. (1996). Psychosocial correlates of physical activity among fifth and eighth graders. *Preventive Medicine, 25*(5), 506-513.
- Csikszentmihalyi, M., & Larson, R. (1984). *Being Adolescent*. New York: Basic Books.
- Duncan, S.C. (1993). The role of cognitive appraisal and friendship provisions in adolescents' affect and motivation toward activity in physical education. *Research Quarterly for Exercise and Sport 64*(3), 314-323.
- Duncan, S.C., Duncan, T.E., & Strycker, L.A. (2005). Sources and types of social support in youth physical activity. *Health Psychology, 24*(1), 3-10.
- Eccles, J.S. (1999). The development of children ages 6 to 14. *The Future of Children, 9*, 30-44.
- Flick, U. (1998). *An introduction to qualitative research*. Thousand Oaks, CA: Sage Publications.

- Furman, W., & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology, 21*, 1016-1024.
- Godin, G., Anderson, D., Lambert, L., & Descharnais, R. (2005). Identifying factors associated with regular physical activity in leisure time among Canadian adolescents. *American Journal of Health Promotion, 20*(1), 20-27.
- Godin, G., Jobin, J., & Bouillon, J. (1986). Assessment of leisure time exercise behavior by self-report: A concurrent validity study. *Canadian Journal of Public Health, 77*, 359-361.
- Godin, G., & Shephard, R.J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Public Health, 77*, 359-361.
- Gustafson, S.L., & Rhodes, R.E. (2006). Parental correlates of physical activity in children and early adolescents. *Sports Medicine, 36*(1), 79-97.
- Hagger, M.S., Chatzisarantis, N., & Biddle, S.J.H. (2001). The influence of self-efficacy and past behaviour on the physical activity intentions of young people. *Journal of Sports Sciences, 19*(9), 711-725.
- Hagger, M.S., Chatzisarantis, N., & Biddle, S.J.H. (2002). The influence of autonomous and controlling motives on physical activity intentions within the theory of planned behaviour. *British Journal of Health Psychology, 7*(3), 283-297.
- Hagger, M.S., Chatzisarantis, N., Biddle, S.J.H., & Orbell, S. (2001). Antecedents of children's physical activity intentions and behaviour: Predictive validity and longitudinal effects. *Psychology and Health, 16*(4), 391-407.

- Heaney, C.A., & Israel, B.A. (1997). Social networks and social support. In K. Glanz, F.M. Lewis, & B. K. Rimer (Eds.), *Health behavior and health education* (pp. 179-205). San Francisco, CA: Jossey-Bass.
- Hendry, L.B. (1989). The influence of adults and peers on adolescents' lifestyle and leisure-styles. In K. Hurrelmann & U. Engel (Eds.), *The social world of adolescents: International perspectives* (pp. 246-263). Berlin, DE: Walter de Gruyter.
- Hohepa, M., Schofield, G., & Kolt, G.S. (2006). Physical activity: What do high school students think? *Journal of Adolescent Health, 39*, 328-336.
- Horn, T.S., & Weiss, M.R. (1991). A developmental analysis of children's self-ability judgments in the physical domain. *Pediatric Exercise Science, 3*, 310-326.
- Jacobs, D.R., Ainsworth, B.E., Hartman, T.J., & Leon, A.S. (2003). A simultaneous evaluation of ten commonly used physical activity questionnaires. *Medicine and Science in Sports and Exercise, 25*(1), 81-91.
- Kahn, E.B., Ramsey, L.T., Brownson, R.C., Heath, G.W., Howze, E.H., Powell, K.E., et al. (2002). The effectiveness of interventions to increase physical activity: A systematic review. *American Journal of Preventive Medicine, 22*(Suppl. 4), 73-107.
- Kerner, M.S., & Kurrant, A.B. (2003). Psychosocial correlates to high school girls' leisure-time physical activity: A test of the theory of planned behavior. *Perceptual and Motor Skills, 97*(3 Pt 2), 1175-1183.

- Kunesh, M.A., Hasbrook, C.A., & Lewthwaite, R. (1992). Physical activity socialization: Peer interactions and affective responses among a sample of sixth grade girls. *Sociology of Sport Journal*, 9, 385-396.
- Leifer, G., & Hartson, H. (2004). *Growth and development across the lifespan: A health promotion focus*. St. Louis, MO: Saunders.
- McKenzie, T.L., Marshall, S.J., Sallis, J.F., & Conway, T.L. (2000). Student activity levels, lesson context, and teacher behavior during middle school physical education. *Research Quarterly for Exercise and Sport*, 71, 249-259.
- Moran, M.M., & Weiss, M.R. (2006). Peer leadership in sport: Links with friendship, peer acceptance, psychological characteristics, and athletic ability. *Journal of Applied Sport Psychology*, 18, 97-113.
- Mummery, W.K., Spence, J.C., & Hudec, J.C. (2000). Understanding physical activity intention in Canadian school children and youth: An application of the theory of planned behavior. *Research Quarterly for Exercise and Sport*, 71(2), 116-124.
- Nahas, M.V., Goldfine, B., & Collins, M.A. (2003). Determinants of physical activity in adolescents and young adults: The basis for high school and college physical education to promote active lifestyles. *Physical Educator*, 60(1), 42-57.
- Neumark-Sztainer, D., Story, M., Hannan, P.J., Tharp, T., & Rex, J. (2003). Factors associated with changes in physical activity: A cohort study of inactive adolescent girls. *Archives of Pediatrics & Adolescent Medicine*, 157, 803-810.
- Newcomb, A.F., & Bagwell, C.I. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin*, 117, 306-347.

- Patrick, H., Ryan, A.M., Alfeld-Liro, C., Fredricks, J.A., Hruda, L.Z., & Eccles, J.S. (1999). Adolescents' commitment to developing talent: The role of peers in continuing motivation for sports and the arts. *Journal of Youth and Adolescence*, 28(6), 741-763.
- Poole, M.E. (1989). Adolescent transitions: A life-course perspective. In K. Hurrelmann & U. Engel (Eds.), *The social world of adolescents: International perspectives* (pp. 65-85). Berlin, DE: Walter de Gruyter.
- Public Health Agency of Canada. (2002). *Activity guidelines*. Retrieved September 10, 2006 from [http://www.phac-aspc.gc.ca/pau-uap/paguide/child\\_youth/youth/guidelines.html](http://www.phac-aspc.gc.ca/pau-uap/paguide/child_youth/youth/guidelines.html)
- Rhodes, R.E., & Courneya, K.S. (2003). Modelling the theory of planned behaviour and past behaviour. *Psychology, Health, & Medicine*, 8(1), 57-69.
- Rhodes, R.E., Jones, L.W., & Courneya, K.S. (2002). Extending the theory of planned behavior in the exercise domain: A comparison of social support and subjective norm. *Research Quarterly for Exercise and Sport*, 73(2), 193-199.
- Robbins, L.B., Pis, M.B., Pender, N.J., & Kazanis, A.S. (2004). Exercise self-efficacy, enjoyment, and feeling states among adolescents. *Western Journal of Nursing Research*, 26(7), 699-715.
- Rubin, K.H., Bukowski, W.M., & Parker, J.G. (1998). Peer interactions, relationships, and groups. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Social, emotional, and personality development* (Vol. 3, pp. 619-700). New York: Wiley.
- Sallis, J.F., Grossman, R.M., Pinski, R.B., Patterson, T.L., & Nader, P.R. (1987). The

- development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*, 825-836.
- Sallis, J.F., & Owen, N. (1999). *Physical activity & behavioral medicine*. Thousand Oaks, CA: Sage Publications.
- Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise, 32*(5), 963-975.
- Sallis, J.F., Prochaska, J.J., Taylor, W.C., Hill, J.O., & Geraci, J.C. (1999). Correlates of physical activity in a national sample of girls and boys in grades 4 through 12. *Health Psychology, 18*(4), 410-415.
- Saunders, R., Motl, R.W., Dowda, M., Dishman, R.K., & Pate, R.R. (2004). Comparison of social variables for understanding physical activity in adolescent girls. *American Journal of Health Behavior, 28*(5), 426-436.
- Saxena, R., Borzekowski, D.L.G., & Rickert, V.I. (2002). Physical activity levels among urban adolescent females. *Journal of Pediatric and Adolescent Gynecology, 15*, 279-284.
- Simons-Morton, B., Haynie, D.L., Crump, A.D., Eitel, P., & Saylor, K.E. (2001). Parent and peer influences on smoking and drinking among early adolescents. *Health Education & Behavior, 28*(1), 95-107.
- Sirard, J.R., & Pate, R.R. (2001). Physical activity assessment in children and adolescents. *Sport Medicine, 31*(6), 439-454.
- Smith, A.L. (1999). Perceptions of peer relationships and physical activity participation in early adolescence. *Journal of Sport & Exercise Psychology, 21*, 329-350.

- Smith, A.L. (2003). Peer relationships in physical activity contexts: A road less traveled in youth sport and exercise psychology research. *Psychology of Sport and Exercise, 4*, 25-39.
- Spink, K.S., Shields, C.A., Chad, K., Odnokon, P., Muhajarine, N., & Humbert, L. (2006). Correlates of structured and unstructured activity among sufficiently active youth and adolescents: A new approach to understanding physical activity. *Pediatric Exercise Science, 18*(2), 203-215.
- Symons Downs, D., Graham, G.M., Yang, S., Bargainnier, S., & Vasil, J. (2006). Youth exercise intention and past exercise behavior: Examining the moderating influences of sex and meeting exercise recommendations. *Research Quarterly for Exercise and Sport, 77*(1), 91-99.
- Symons Downs, D., & Hausenblas, H.A. (2003). Exercising for two: Examining p pregnant women's second trimester exercise intention and behavior using the framework of the theory of planned behavior. *Women's Health Issues, 13*(6), 222-228.
- Symons Downs, D., & Hausenblas, H.A. (2004). Women's exercise beliefs and behaviors during their pregnancy and postpartum. *Journal of Midwifery & Women's Health, 49*(2), 138-144.
- Trinh, L., Rhodes, R.E., & Ryan, S.M. (in press). Gender differences in belief-based targets for physical activity intervention among adolescents. *Social Behavior and Personality*.
- Trost, S.G., Pate, R.R., Dowda, M.S., Ward, D.S., Felton, G., & Saunders, R. (2002).

- Psychosocial correlates of physical activity in white and african-american girls. *Journal of Adolescent Health, 31*(3), 226-233.
- Trost, S.G., Saunders, R., & Ward, D.S. (2002). Determinants of physical activity in middle school children. *American Journal of Health Behavior, 26*(2), 95-102.
- Tsorbatzoudis, H. (2005). Evaluation of a school-based intervention programme to promote physical activity: An application of the theory of planned behavior. *Perceptual and Motor Skills, 101*, 787-802.
- Ullrich-French, S., & Smith, A.L. (2006). Perceptions of relationships with parents and peers in youth sport: Independent and combined prediction of motivational outcomes. *Psychology of Sport and Exercise, 7*, 193-214.
- U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, GA: Centers for Disease Control.
- Vazou, S., Ntoumanis, N., & Duda, J.L. (2005). Peer motivational climate in youth sport: A qualitative inquiry. *Psychology of Sport and Exercise, 6*, 497-516.
- Voorhees, C.C., Murray, D., Welk, G., Birnbaum, A., Ribisl, K.M., Johnson, C.C., et al. (2005). The role of peer social network factors and physical activity in adolescent girls. *American Journal of Health Behavior, 29*(2), 183-190.
- Weiss, M.R., & Duncan, S.C. (1992). The relationship between physical competence and peer acceptance in the context of children's sports participation. *Journal of Sport & Exercise Psychology, 14*, 177-191.
- Weiss, M.R., & Smith, A.L. (2002). Friendship quality in youth sport: Relationship to age, gender, and motivation variables. *Journal of Sport & Exercise Psychology, 24*, 420-437.

Weiss, R.S. (1974). The provisions of social relationships. In Z. Rubin (Ed.), *Doing unto others* (pp. 17-26). Englewood Cliffs, NJ: Prentice Hall.

Wold, B., & Anderssen, N. (1992). Health promotion aspects of family and peer influences on sport participation. (1992). *International Journal of Sport Psychology*, 23, 343-359.

## **APPENDIX A:**

### **Written Informed Consent for Students**



## *Student Consent Form*

School of Physical  
Education,  
University of Victoria  
PO Box 3015 STN CSC,  
Victoria, BC V8W 3P1  
Canada

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Dear Student:

My name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

### **Purpose and Objectives**

The purpose of this research is aimed at understanding the role of your friends or peers in changing the way you feel about physical activity.

### **Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for adopting physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

### **Participants Selection**

You are being asked to participate in this study because you are female and between 13-17 years of age. These factors have been chosen based on the objectives of the study.

### **What is involved**

If you agree to voluntarily participate in this research, you will be given a complimentary membership to the McKinnon gym at the University of Victoria for the duration of the study. The one-month membership will entitle you to attend the gym as often as you wish (outside class time), and will allow you to bring an additional non-member friend to the gym. You will have the option of either attending the 4-week program with friends or alone. You and your guest (if applicable) will need to bring your student identification card or photo identification along with your membership card to gain entry into the facilities. It is important that you attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with

you or you may not be able to participate in this study. At this meeting, you will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in your student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding your beliefs and intentions about physical activity, your social support network, and your physical activity patterns. You will be asked to fill out these questionnaires at the start of the study, and again at the end of the 4-week program. The follow-up meeting (at the end of the 4-week program) will be held on \_\_\_\_\_.

### **Inconvenience**

Participation in this study may cause some inconvenience to you, including attending an information meeting to complete questionnaires after school for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

### **Risks**

There are some potential risks to you by participating in this research. After a session of physical activity, you may feel tired due to the energy demands required in performing exercise. To prevent this risk, you should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. You should also carry a light snack with you to eat after each session. You will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the gym may result in injury. In order to avoid injury, it is mandatory that you attend the information meeting held on \_\_\_\_\_ as you will be given an instructional session on how to safely and effectively use all exercise equipment associated with the gym by trained staff at the facility. The gym will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If you do not attend this information meeting, you will not be able to participate in the study due to the risks involved. In addition, you will be required to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

### **Benefits**

The potential benefits of your participation in this research are that you will have the opportunity to participate and learn about the research process. Participating in this study will entitle you to a free one-month membership to a local fitness and health centre that will introduce you to various types of exercise equipment and allow you to exercise with your friends.

**Compensation**

As a way to compensate you for any inconvenience related to your participation, you will be given a discount coupon to Peninsula Runners at Shelbourne Plaza towards the purchase of fitness apparel. You will also be given further complimentary passes to the drop-in fitness classes at the McKinnon gym for use after the study. If you agree to participate in this study, this form of compensation to you must not be forceful. It is unethical to provide undue compensation to research participants. If you would not participate if the compensation was not offered, then you should decline.

**Voluntary Participation**

Your participation in this research project is completely voluntary, and you may withdraw from the study at any time without any consequences (including your academic standing at the school) or explanation. If you withdraw from the study, your data will not be used and you will be entitled to keep your one-month membership to the fitness and health centre.

**On-going Consent**

To make sure that you continue to consent to participate in this research, the researcher will verbally remind you of all the contents in the consent letter throughout the duration of the research process. The researcher will also remind you that participation in this research project is completely voluntary, and that you have the option of withdrawing from the study at any time without any consequences (including your academic standing in your class and school) or explanation.

**Anonymity**

The information collected will remain private and confidential. Even though you are required to fill out your name for the questionnaires, your name will not be used for identification purposes. Instead questionnaires you fill out will be given a number for identification purposes.

**Confidentiality**

Your confidentiality and the confidentiality of the data will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness and health centre, it is possible for other participants to identify that you are involved with this study and vice-versa, given that you all attend the same secondary school. Also, the nature and size of the sample from which you were drawn from makes it possible for other participants to identify that you were involved in this study and vice-versa because you will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that you will fill out will be confidential. A list containing your name and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Your name will not appear in any document or written study.

### **Distribution of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

### **Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

### **Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria, the District School Board, and the principal of the secondary school involved. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098 or ikus@lycos.com, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545 or ethics@uvic.ca. Thank you.

Your co-operation in this study will be greatly appreciated. Please sign and return this form at the information meeting on \_\_\_\_\_.

Your signature below indicates that you understand the above conditions of your participation in this study and that you have had the opportunity to have your questions answered by the researcher.

<i>Name of Participant</i>	<i>Signature</i>	<i>Date</i>
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***A copy of this consent will be left with you, and a copy will be taken by the researcher.***

**APPENDIX B:**

**Written Informed Consent for Parents**



## *Parent Consent Form*

School of Physical  
Education,  
University of Victoria  
PO Box 3015 STN CSC,  
Victoria, BC V8W 3P1  
Canada

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Dear Parent/Guardian:

My name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

### **Purpose and Objectives**

The purpose of this study is to examine the relationship between peer support, attitudes to physical activity and adherence to a physical activity program using the Theory of Planned Behaviour.

### **Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for acquiring physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

### **Participants Selection**

Your daughter is being asked to participate in this study because she is female and between 13-17 years of age. These factors have been chosen based on the objectives of the study.

### **What is involved**

If your daughter agrees to voluntarily participate in this research, she will be given a complimentary membership to the McKinnon gym at the University of Victoria for the duration of the study. The one-month membership will entitle her to attend the gym as often as she wishes (outside class time), and will allow her to bring an additional non-member friend to the gym. She will have the option of either attending the 4-week program with friends or alone. She and her guest (if applicable) will need to bring their student identification card or photo identification along with the membership card to gain

entry into the facilities. It is important that she attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with her or she may not be able to participate in this study. At this meeting, she will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in her student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding her beliefs and intentions about physical activity, her social support network, and her physical activity patterns. She will be asked to fill out these questionnaires at the start of the study, and again at the end of the 4-week program. The follow-up meeting (at the end of the 4-week program) will be held on \_\_\_\_\_.

### **Inconvenience**

Participation in this study may cause some inconvenience to your daughter, including attending an information meeting after school to complete questionnaires for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

### **Risks**

There are some potential risks to your daughter by participating in this research. After a session of physical activity, she may feel tired due to the energy demands required in performing exercise. To prevent this risk, she should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. She should also carry a light snack with her to eat after each session. She will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the fitness centre may result in injury. In order to avoid injury, it is mandatory that she attend the information meeting held on \_\_\_\_\_ as she will be given an instructional session on how to safely and effectively use all exercise equipment associated with the fitness and health centre by trained staff at the facility. The fitness and health centre will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If she does not attend this information meeting, she will not be able to participate in the study due to the risks involved. In addition, your daughter will be required to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

### **Benefits**

The potential benefits of your participation in this research are that your daughter will have the opportunity to participate and learn about the research process. Participating in

this study will entitle her to a free one-month membership to a local fitness and health centre that will introduce her to various types of exercise equipment and allow her to exercise with her friends.

### **Compensation**

As a way to compensate your daughter for any inconvenience related to her participation, she will be given a discount coupon to Peninsula Runners at Shelbourne Plaza towards the purchase of fitness apparel. She will also be given further complimentary passes to the drop-in fitness classes at the McKinnon gym for use after the study. If she agrees to participate in this study, this form of compensation to her must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If she would not participate if the compensation was not offered, then she should decline.

### **Voluntary Participation**

Your daughter's participation in this research project is completely voluntary, and she may withdraw from the study at any time without any consequences (including her academic standing at the school) or explanation. If she withdraws from the study, her data will not be used and she will be entitled to keep her one-month membership to the fitness and health facility.

### **On-going Consent**

To make sure that your daughter continues to consent to participate in this research, the researcher will verbally remind her of all the contents in the consent letter throughout the duration of the research process. The researcher will also remind her that participation in this research project is completely voluntary, and that she has the option of withdrawing from the study at any time without any consequences (including her academic standing in her class and school) or explanation.

### **Anonymity**

The information collected will remain private and confidential. Even though your daughter is required to fill out her name for the questionnaires, her name will not be used for identification purposes. Instead questionnaires she fills out will be given a number for identification purposes.

### **Confidentiality**

Your daughter's confidentiality and the confidentiality of the data will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness and health centre, it is possible for other participants to identify that your daughter was involved with this study and vice-versa, given that they all attend the same secondary school. Also, the nature and size of the sample from which your daughter was drawn from makes it possible for other participants to identify that she was involved in this study and vice-versa because they will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that your daughter will fill out will be confidential. A list containing your daughter's name and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the

University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Your daughter's name will not appear in any document or written study.

### **Dissemination of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

### **Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

### **Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria, the District School Board, and the principal of the secondary school involved. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098 or ikus@lycos.com, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545 or ethics@uvic.ca. Thank you.

Your co-operation in this study will be greatly appreciated. Please sign and return this form to your daughter to bring to the information meeting on \_\_\_\_\_.

Your signature below indicates that you understand the above conditions of your daughter's participation in this study and that you have had the opportunity to have your questions answered by the researcher.

---

*Name of Participant*

---

*Signature*

---

*Date*

*A copy of this consent will be left with you, and a copy will be taken by the researcher.*

**APPENDIX C:**

**Written Informed Consent for School Principal**



School of Physical  
Education,  
University of Victoria  
PO Box 3015 STN CSC,  
Victoria, BC V8W 3P1  
Canada

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## *School Principal Consent Form*

Dear Principal:

My name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

My intention is to conduct this study from the April to June period of the 2007 school year with a sample of 210 inactive female adolescents ages 13-17 years old from \_\_\_\_\_. I would be very grateful if you would be willing to allow me to recruit students from this age group at your school.

### **Purpose and Objectives**

The purpose of this study is to examine the relationship between peer support, attitudes to physical activity and adherence to a physical activity program using the Theory of Planned Behaviour.

### **Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for acquiring physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

### **Participants Selection**

Students are being asked to participate in this study because they are female and between 13-17 years of age. These factors have been chosen based on the objectives of the study. A 10-minute presentation will be given to the homerooms of the target population by the researcher in order to recruit participants for the study. I have selected your school because of the close proximity of this school to the McKinnon gym at the University of Victoria where the program will take place. This will be convenient for students to take part in this study.

### **What is involved**

If the students agree to voluntarily participate in this research, they will be given a complimentary membership to the McKinnon gym at the University of Victoria for the duration of the study. The one-month membership will entitle them to attend the gym as often as they wish (outside class time), and will allow them to bring an additional non-member friend to the gym. They will have the option of either attending the 4-week program with friends or alone. The students and their guest (if applicable) will need to bring their student identification card or photo identification along with the membership card to gain entry into the facilities. It is important that the students attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with them or they may not be able to participate in this study. At this meeting, they will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in their student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding their beliefs and intentions about physical activity, their social support network, and their physical activity patterns. They will be asked to fill out these questionnaires at the start of the study (May 2007), and again at the end of the 4-week program (June 2007). A quiet classroom would be required (after school) for students to complete the questionnaires for this study.

### **Inconvenience**

Participation in this study may cause some inconvenience to the students, including attending an information meeting after school to complete questionnaires for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

### **Risks**

There are some potential risks to the students by participating in this research. After a session of physical activity, they may feel tired due to the energy demands required in performing exercise. To prevent this risk, they should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. They should also carry a light snack with them to eat after each session. The students will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the fitness centre may result in injury. In order to avoid injury, it is mandatory that the students attend the information meeting held on \_\_\_\_\_ as they will be given an instructional session on how to safely and effectively use all exercise equipment associated with the fitness and health centre by trained staff at the facility. The fitness and health centre will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If they do not attend this information meeting, they will not be able to participate in the study due to the risks involved. In addition, students will be required to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the

information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

### **Benefits**

The potential benefits of students participating in this research are that they will have the opportunity to participate and learn about the research process. Participating in this study will entitle them to a free one-month membership to a local fitness and health centre that will introduce them to various types of exercise equipment and allow them to exercise with their friends.

### **Compensation**

As a way to compensate the students for any inconvenience related to her participation, they will be given a discount coupon to Peninsula Runners at Shelbourne Plaza towards the purchase of fitness apparel. They will also be given further complimentary passes to the drop-in fitness classes at the McKinnon gym for use after the study. If they agree to participate in this study, this form of compensation to them must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If they would not participate if the compensation was not offered, then they will be asked to decline.

### **Voluntary Participation**

Participation in this research project is completely voluntary, and the students may withdraw from the study at any time without any consequences (including your academic standing at the school) or explanation. If they withdraw from the study, their data will not be used and they will be entitled to keep their one-month membership to the fitness and health facility.

### **On-going Consent**

To make sure that students continue to consent to participate in this research, the researcher will verbally remind them of all the contents in the consent letter throughout the duration of the research process. The researcher will also remind them that participation in this research project is completely voluntary, and that they have the option of withdrawing from the study at any time without any consequences (including their academic standing in their class and school) or explanation.

### **Anonymity**

The information collected will remain private and confidential. Even though students will be required to fill out their name for the questionnaires, their names will not be used for identification purposes. Instead questionnaires they fill out will be given a number for identification purposes.

### **Confidentiality**

Confidentiality and the confidentiality of the data of the students will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness

and health centre, it is possible for other participants to identify that certain students were involved with this study and vice-versa, given that they all attend the same secondary school. Also, the nature and size of the sample from which the students were drawn from makes it possible for other participants to identify that they were involved in this study and vice-versa because they will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that the students will fill out will be confidential. A list containing student names and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Student names will not appear in any document or written study.

### **Distribution of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

### **Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

### **Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria and the District School Board involved. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545.

Your co-operation in this study will be greatly appreciated and I would be pleased to hear from you at your earliest convenience. Thank you.

**APPENDIX D:**

**Written Informed Consent for District School Board**



School of Physical  
Education,  
University of Victoria  
PO Box 3015 STN CSC,  
Victoria, BC V8W 3P1  
Canada

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## *District School Board*

### *Consent Form*

Dear District School Board:

My name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

My intention is to conduct this study from the April to June period of the 2007 school year with a sample of 210 female adolescents ages 13-17 years old from \_\_\_\_\_ . I would be very grateful if you would be willing to allow me to recruit students from this age group at this school.

#### **Purpose and Objectives**

The purpose of this study is to examine the relationship between peer support, attitudes to physical activity and adherence to a physical activity program using the Theory of Planned Behaviour.

#### **Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for acquiring physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

#### **Participants Selection**

Students are being asked to participate in this study because they are female and between 13-17 years of age. These factors have been chosen based on the objectives of the study. A 10-minute presentation will be given to the homerooms of the target population by the researcher in order to recruit participants for the study. I have selected this school because of the close proximity of this school to McKinnon gym where the program will take place. This will be convenient for students to take part in this study.

### **What is involved**

If the students agree to voluntarily participate in this research, they will be given a complimentary membership to the McKinnon gym at the University of Victoria for the duration of the study. The one-month membership will entitle them to attend the gym as often as they wish (outside class time), and will allow them to bring an additional non-member friend to the gym. They will have the option of either attending the 4-week program with friends or alone. The students and their guest (if applicable) will need to bring their student identification card or photo identification along with the membership card to gain entry into the facilities. It is important that the students attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with them or they may not be able to participate in this study. At this meeting, they will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in their student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding their beliefs and intentions about physical activity, their social support network, and their physical activity patterns. They will be asked to fill out these questionnaires at the start of the study (May 2007), and again at the end of the 4-week program (June 2007). A quiet classroom would be required (after school) for students to complete the questionnaires for this study.

### **Inconvenience**

Participation in this study may cause some inconvenience to the students, including attending an information meeting after school to complete questionnaires for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

### **Risks**

There are some potential risks to the students by participating in this research. After a session of physical activity, they may feel tired due to the energy demands required in performing exercise. To prevent this risk, they should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. They should also carry a light snack with them to eat after each session. The students will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the fitness centre may result in injury. In order to avoid injury, it is mandatory that the students attend the information meeting held on \_\_\_\_\_ as they will be given an instructional session on how to safely and effectively use all exercise equipment associated with the fitness and health centre by trained staff at the facility. The fitness and health centre will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If they do not attend this information meeting, they will not be able to participate in the study due to the risks involved. In addition, students will be required to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the

information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

### **Benefits**

The potential benefits of students participating in this research are that they will have the opportunity to participate and learn about the research process. Participating in this study will entitle them to a free one-month membership to a local fitness and health centre that will introduce them to various types of exercise equipment and allow them to exercise with their friends.

### **Compensation**

As a way to compensate the students for any inconvenience related to her participation, they will be given a discount coupon to Peninsula Runners at Shelbourne Plaza towards the purchase of fitness apparel. They will also be given further complimentary passes to the drop-in fitness classes at the McKinnon gym for use after the study. If they agree to participate in this study, this form of compensation to them must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If they would not participate if the compensation was not offered, then they will be asked to decline.

### **Voluntary Participation**

Participation in this research project is completely voluntary, and the students may withdraw from the study at any time without any consequences (including your academic standing at the school) or explanation. If they withdraw from the study, their data will not be used and they will be entitled to keep their one-month membership to the fitness and health facility.

### **On-going Consent**

To make sure that students continue to consent to participate in this research, the researcher will verbally remind them of all the contents in the consent letter throughout the duration of the research process. The researcher will also remind them that participation in this research project is completely voluntary, and that they have the option of withdrawing from the study at any time without any consequences (including their academic standing in their class and school) or explanation.

### **Anonymity**

The information collected will remain private and confidential. Even though students will be required to fill out their name for the questionnaires, their names will not be used for identification purposes. Instead questionnaires they fill out will be given a number for identification purposes.

### **Confidentiality**

Confidentiality and the confidentiality of the data of the students will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness

and health centre, it is possible for other participants to identify that certain students were involved with this study and vice-versa, given that they all attend the same secondary school. Also, the nature and size of the sample from which the students were drawn from makes it possible for other participants to identify that they were involved in this study and vice-versa because they will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that the students will fill out will be confidential. A list containing student names and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Student names will not appear in any document or written study.

### **Distribution of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

### **Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

### **Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545.

Your co-operation in this study will be greatly appreciated and I would be pleased to hear from you at your earliest convenience. Thank you.

**APPENDIX E:**

**Written Informed Consent for Fitness and Health Centre**

**Co-ordinator**



School of Physical  
Education,  
University of Victoria  
PO Box 3015 STN CSC,  
Victoria, BC V8W 3P1  
Canada

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***Fitness and Health  
Centre Co-ordinator  
Consent Form***

Dear Co-ordinator:

My name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

My intention is to conduct this study from the April to June period of the 2007 school year with a sample of 210 female adolescents ages 13-17 years old from \_\_\_\_\_ Secondary School.

**Purpose and Objectives**

The purpose of this study is to examine the relationship between peer support, attitudes to physical activity and adherence to a physical activity program using the Theory of Planned Behaviour.

**Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for acquiring physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

**Participants Selection**

Students are being asked to participate in this study because they are female and between 13-17 years of age. These factors have been chosen based on the objectives of the study. I have selected this fitness and health facility because of the close proximity of it to the school involved. This will be convenient for students to take part in this study. I would be very grateful if you would be willing to allow me to use your facilities for the duration of the program, as well as obtaining complimentary one-month memberships for the participants and their guests in this study.

**What is involved**

If the students agree to voluntarily participate in this research, they will be given a complimentary membership to a fitness and health centre facility for the duration of the study. The one-month membership will entitle them to attend the gym as often as they wish (outside class time), and will allow them to bring an additional non-member friend to the gym. They will have the option of either attending the 4-week program with friends or alone. The students and their guest (if applicable) will need to bring their student identification card or photo identification along with the membership card to gain entry into the facilities. It is important that the students attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with them or they may not be able to participate in this study. At this meeting, they will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in their student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding their beliefs and intentions about physical activity, their social support network, and their physical activity patterns. They will be asked to fill out these questionnaires at the start of the study (February 2007), and again at the end of the 4-week program (March 2007).

**Inconvenience**

Participation in this study may cause some inconvenience to the students, including attending an information meeting after school to complete questionnaires for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

**Risks**

There are some potential risks to the students by participating in this research. After a session of physical activity, they may feel tired due to the energy demands required in performing exercise. To prevent this risk, they should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. They should also carry a light snack with them to eat after each session. The students will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the fitness centre may result in injury. In order to avoid injury, it is mandatory that the students attend the information meeting held on \_\_\_\_\_ as they will be given an instructional session on how to safely and effectively use all exercise equipment associated with the fitness and health centre by trained staff at the facility. The fitness and health centre will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If they do not attend this information meeting, they will not be able to participate in the study due to the risks involved. I would be very grateful if you would be able to spare some staff during the information meeting to discuss safety guidelines to the participants involved in the study. In addition, students will be required

to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

### **Benefits**

The potential benefits of students participating in this research are that they will have the opportunity to participate and learn about the research process. Participating in this study will entitle them to a free one-month membership to a local fitness and health centre that will introduce them to various types of exercise equipment and allow them to exercise with their friends.

### **Compensation**

As a way to compensate the students for any inconvenience related to their participation, they will be given a discount coupon to Peninsula Runners located in Shelbourne Plaza. If they agree to participate in this study, this form of compensation to them must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If they would not participate if the compensation was not offered, then they will be asked to decline.

### **Voluntary Participation**

Participation in this research project is completely voluntary, and the students may withdraw from the study at any time without any consequences (including your academic standing at the school) or explanation. If they withdraw from the study, their data will not be used and they will be entitled to keep their one-month membership to the fitness and health facility.

### **On-going Consent**

To make sure that students continue to consent to participate in this research, the researcher will verbally remind them of all the contents in the consent letter throughout the duration of the research process. The researcher will also remind them that participation in this research project is completely voluntary, and that they have the option of withdrawing from the study at any time without any consequences (including their academic standing in their class and school) or explanation.

### **Anonymity**

The information collected will remain private and confidential. Even though students will be required to fill out their name for the questionnaires, their names will not be used for identification purposes. Instead questionnaires they fill out will be given a number for identification purposes.

### **Confidentiality**

Confidentiality and the confidentiality of the data of the students will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness and health centre, it is possible for other participants to identify that certain students were involved with this study and vice-versa, given that they all attend the same secondary

school. Also, the nature and size of the sample from which the students were drawn from makes it possible for other participants to identify that they were involved in this study and vice-versa because they will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that the students will fill out will be confidential. A list containing student names and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Student names will not appear in any document or written study.

### **Distribution of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

### **Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

### **Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria, the District School Board, and the principal of the secondary school involved. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545.

Your co-operation in this study will be greatly appreciated and I would be pleased to hear from you at your earliest convenience. Thank you.

**APPENDIX F:**  
**Participant Recruitment Presentation**

## **Participant Recruitment Presentation**

Hello, my name is Linda Trinh and I am a graduate student at the University of Victoria in Victoria, British Columbia. As a graduate student, I am required to conduct research as part of the requirements of a degree in the Masters of Arts in the School of Physical Education under the direct supervision of Dr. Patti-Jean Naylor.

### **Purpose and Objectives**

The purpose of this research is aimed at understanding the role of your friends or peers in changing the way you feel about physical activity.

### **Importance of this Research**

Research of this type is important given that adolescent girls have been consistently shown to have lower levels of physical activity compared to boys. Also, adolescence is an important period for adopting physical activity patterns that will continue into adulthood. Conducting this research may assist in developing appropriate and effective physical activity programs aimed at increasing physical activity levels among adolescent girls.

### **Participants Selection**

You are being asked to participate in this study if you meet the following selection criteria: you are female and between 13-17 years of age. These factors have been chosen based on the objectives of the study.

### **What is involved**

If you agree to voluntarily participate in this research, you will be given a complimentary membership to the McKinnon gym at the University of Victoria for the duration of the study. The one-month membership will entitle you to attend the gym as often as you wish (outside class time), and will allow you to bring an additional non-member friend to the gym. You will have the option of either attending the 4-week program with friends or alone. You and your guest (if applicable) will need to bring your student identification card or photo identification along with your membership card to gain entry into the facilities. It is important that you attend the information meeting held on \_\_\_\_\_, and bring both the signed parent and student consent forms with you or you may not be able to participate in this study. At this meeting, you will learn safe and effective techniques for using the fitness and weight centre by the researcher, complete the Physical Activity Readiness Questionnaire (PAR-Q), as well as hand in your student and parent consent forms. Information for this study will be collected through a series of questionnaires and a physical activity tracking sheet. The questionnaires will contain questions regarding your beliefs and intentions about physical activity, your social support network, and your physical activity patterns. You will be asked to fill out these questionnaires at the start of the study, and again at the end of the 4-week program.

**Inconvenience**

Participation in this study may cause some inconvenience to you, including attending an information meeting after school to complete questionnaires for approximately 1.5 hours, dedicating 4 weeks to the participation of a physical activity program at a fitness and health facility (outside class time), filling out a physical activity tracking sheet after each fitness session which will take 2 minutes, and attending a follow-up meeting to complete questionnaires (at the end of the program) after school for approximately 45 minutes.

**Risks**

There are some potential risks to you by participating in this research. After a session of physical activity, you may feel tired due to the energy demands required in performing exercise. To prevent this risk, you should drink plenty of fluids (e.g. sports drink, water) during and after each physical activity session. You should also carry a light snack with you to eat after each session. You will be reminded of these guidelines by the researcher at the information meeting. Also, improper use of exercise equipment and failure to follow safety guidelines at the fitness and health centre may result in injury. In order to avoid injury, it is mandatory that you attend the information meeting held on \_\_\_\_\_ as you will be given an instructional session on how to safely and effectively use all exercise equipment associated with the fitness and health centre by trained staff at the facility. The fitness and health centre will be constantly supervised by trained staff at every session to ensure safety and to address any questions/concerns the participants may have. If you do not attend this information meeting, you will not be able to participate in the study due to the risks involved. In addition, you will be required to fill out the Physical Activity Readiness Questionnaire (PAR-Q) at the information meeting. The purpose of the PAR-Q is to determine the individuals who should see their doctor before becoming physically active and to ensure that individuals do not have any health problems that may be complicated by participating in physical activity.

**Benefits**

The potential benefits of your participation in this research are that you will have the opportunity to participate and learn about the research process. Participating in this study will entitle you to a free one-month membership to a local fitness and health centre that will introduce you to various types of exercise equipment and allow you to exercise with your friends.

**Compensation**

As a way to compensate you for any inconvenience related to her participation, you will be given a discount coupon to Peninsula Runners at Shelbourne Plaza towards the purchase of fitness apparel. You will also be given further complimentary passes to the drop-in fitness classes at the McKinnon gym for use after the study. If you agree to participate in this study, this form of compensation to you must not be forceful. It is unethical to provide undue compensation to research participants. If you would not participate if the compensation was not offered, then you should decline. If you choose to withdraw from the study, you will be entitled to keep your one-month complimentary membership to the local fitness and health centre, as well as the discount coupon.

**Voluntary Participation**

Your participation in this research project is completely voluntary, and you may withdraw from the study at any time without any consequences or explanation. Your participation is voluntary, and in no way affect your grades or class standing at this school. If you withdraw from the study, your data will not be used and you will be entitled to keep your one-month membership to the fitness and health centre and the discount coupon. Also, there will be no effect on your grades or class standing at this school if you choose to withdraw or choose not to participate in this study.

**On-going Consent**

To make sure that you continue to consent to participate in this research, the researcher will verbally remind you of all the contents in the consent letter at the follow-up meeting. The researcher will also remind you that participation in this research project is completely voluntary, and that you have the option of withdrawing from the study at any time without any consequences (including your academic standing in your class and school) or explanation.

**Anonymity**

The information collected will remain private and confidential. Even though you are required to fill out your name for the questionnaires, your name will not be used for identification purposes. Instead questionnaires you fill out will be given a number for identification purposes.

**Confidentiality**

Your confidentiality and the confidentiality of the data will be protected in the following ways, with some limits. Due to the nature of the 4-week program at the fitness and health centre, it is possible for other participants to identify that you are involved with this study and vice-versa, given that you all attend the same secondary school. Also, the nature and size of the sample from which you were drawn from makes it possible for other participants to identify that you were involved in this study and vice-versa because you will all attend the same information meeting and follow-up meeting in the same classroom. Nevertheless, all questionnaires that you will fill out will be confidential. A list containing your name and questionnaire numbers will be kept separate from the questionnaires themselves in a locked cabinet at the Institute for Applied Physical Activity and Health Research at the University of Victoria. All electronic data will be kept in password protected files. Only the researchers will have access to the information during and after the study. Your name will not appear in any document or written study.

**Distribution of Results**

It is anticipated that the results of this study will be shared with others in the following ways. The results will be distributed directly to the participants, published article, thesis report, and presentations at scholarly meetings.

**Disposal of Data**

The data and identification list will be destroyed within five years of the study (after the study has been written). All electronic data will be erased and paper copies of the data will be shredded.

**Contacts**

Permission to conduct the project has been granted from the Human Research Ethics Board at the University of Victoria, the District School Board, and the principal of the secondary school involved. Should you require further information or have any questions concerning this investigation, please contact either myself (Linda Trinh) at (250) 588-2098, or my supervisor Dr. Patti-Jean Naylor at (250) 721-7844. In addition to being able to contact the researcher and the associated supervisor at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Associate Vice-President, Research at the University of Victoria (250) 472-4545 or [ethics@uvic.ca](mailto:ethics@uvic.ca).

Again, if you are interested in participating in this study, please attend the meeting held on \_\_\_\_\_, 2007 at 4:00 pm in Room \_\_\_\_\_ at \_\_\_\_\_ Secondary School for further instructions for the study. Thank you.

**APPENDIX G:**  
**Instructions Given to Participants**

### **Instructions Given to Subjects Prior to Testing**

Hello, my name is Linda Trinh and I am a researcher from the School of Physical Education at the University of Victoria, where we are conducting research into the involvement of adolescents in physical activity.

In carrying out this research, I am trying to gain a better understanding of the influence of your friends or peers in your physical activity participation. The information that you will be providing today will be used to help physical activity professionals and researchers gain a better understanding of how to create physical activity programs that are enjoyable for adolescents. Even though you will be required to fill out your name for the questionnaires, all of the responses you will provide today will be confidential and anonymous. No one will have access or read the questionnaire except myself, and no one will be provided with any knowledge of your personal responses. Your responses to these questionnaires will have no effect on your academic standing at \_\_\_\_\_ Secondary School.

This is not a test and there is no right or wrong answers. Rather, this is a questionnaire to gather information about your thoughts on physical activity. It is extremely important that you take your time and think carefully and honestly about each answer before answering the questions.

#### Questionnaire Instructions:

*Physical Activity Beliefs and Intentions Questionnaire:* Listed below are several questions which are designed to give you the opportunity to provide your opinions about physical activity. For example, one question might ask you to “strongly agree” or “strongly disagree” with the statement. Circle the most appropriate response.

Sample question (written on board):

I like to play soccer:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

In this question, if I believe that the statement represents me, I would circle #7 (strongly agree), which states that I strongly agree that I like to play soccer.

*Social Support and Exercise Survey:* Listed below are several questions which are designed to give you the opportunity to provide your opinions about your friends and physical activity. For example, one question might ask you to rate how often your friends might have said or done what is described during the last three months. Circle the most appropriate response.

Sample question (written on board):

During the past month, my friends went to the movies with me:

none	rarely	a few times	often	very often
1	2	3	4	5

In this question, if I believe that the statement does not represent me, I would circle #1 (none) which states that none of my friends went with me to the movies in the last month.

*Godin Leisure-Time Exercise Questionnaire:* Listed below are three questions that ask you to reflect on the physical activity that you have done over a typical week in the past month. It also asks how many times per week you perform strenuous, moderate, and mild exercise for more than 30 minutes during your free time. Write on each line the appropriate number.

Program Instructions (after all questionnaires have been filled out):

The program will be for the duration of 4 weeks and you will be given a complimentary membership to a fitness and health centre facility for the duration of the study. The one-month membership will entitle you to attend the gym as often as you wish (outside class time), and will allow you to bring an additional non-member friend to the gym. You will have the option of either attending the 4-week intervention program with friends or alone. You and your guest (if applicable) will need to bring your student identification card or photo identification along with the membership card to gain entry into the facilities.

*Physical Activity Tracking Sheet:* Please fill out this chart after each physical activity session at the health and fitness centre. Indicate the date in which you attended the session, the type of activity performed (e.g. weights, stationary bike, basketball, etc.), the duration of the activity (in minutes or hours), and whether or not you attended the session with a friend. At the end of the 4-week program, please return this sheet to the researcher.

**APPENDIX H:**

**Godin Leisure-Time Exercise Questionnaire**

## Godin Leisure-Time Exercise Questionnaire

Please answer the following questionnaire to the best of your ability. Take your time to think about your response to each question carefully and honestly before answering. All responses will remain confidential and it will not reflect your grade in any way. If you have any questions about this questionnaire, raise your hand and an instructor will assist you.

Please fill out your grade, age, name, and e-mail (for tracking purposes only)

**Grade:**\_\_\_\_\_ **Age:**\_\_\_\_\_ **Name:**\_\_\_\_\_ **E-mail:**\_\_\_\_\_

1. During a typical **7-Day period** (a week) over the past month, how many times on the average do you do the following kinds of exercise for **more than 30 minutes** during your free time (write on each line the appropriate number).

	<b>Times Per Week</b>
<p><b>a) STRENUOUS EXERCISE (HEART BEATS RAPIDLY)</b> (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)</p>	_____
<p><b>b) MODERATE EXERCISE (NOT EXHAUSTING)</b> (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)</p>	_____
<p><b>c) MILD EXERCISE (MINIMAL EFFORT)</b> (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)</p>	_____

**The questionnaire is now complete.  
Please hand in the questionnaire to the instructor.  
Thank you!**

**APPENDIX I:**  
**Physical Activity Tracking Sheet**





**APPENDIX J:**

**Social Support Scale for Exercise Behaviours**

## Social Support Scale for Exercise Behaviours

Please answer the following questionnaire to the best of your ability. Take your time to think about your response to each question carefully and honestly before answering. Be sure to answer all the questions, and never circle more than one number on a given question. All responses will remain confidential and it will not reflect your grade in any way. If you have any questions about this questionnaire, raise your hand and an instructor will assist you.

Please fill out your grade, age, name, and e-mail (for tracking purposes only)

**Grade:**\_\_\_\_\_ **Age:**\_\_\_\_\_ **Name:**\_\_\_\_\_ **E-mail:**\_\_\_\_\_

*Rate how often your friends might have said or done what is described during the past month.*

none   rarely   a few   often   very  
times                    times                    often

During the past month, my friends:

- |  |  | 1 | 2 | 3 | 4 | 5 |
|--|--|---|---|---|---|---|
| 1. Exercised with me.  |  | 1 | 2 | 3 | 4 | 5 |
| 2. Offered to exercise with me.  |  | 1 | 2 | 3 | 4 | 5 |
| 3. Gave me helpful reminders to exercise<br>(for example "are you going to exercise tonight?") |  | 1 | 2 | 3 | 4 | 5 |
| 4. Gave me encouragement to stick with my<br>exercise program.                                 |  | 1 | 2 | 3 | 4 | 5 |
| 5. Changed their schedule so we could exercise<br>together.                                    |  | 1 | 2 | 3 | 4 | 5 |
| 6. Discussed exercise with me.   |  | 1 | 2 | 3 | 4 | 5 |
| 7. Complained about the time I spend exercising.   |  | 1 | 2 | 3 | 4 | 5 |
| 8. Criticized me or made fun of me for exercising.   |  | 1 | 2 | 3 | 4 | 5 |
| 9. Gave me rewards for exercising<br>(bought me something or gave me something I like)         |  | 1 | 2 | 3 | 4 | 5 |
| 10. Planned for exercise on recreational outings.  |  | 1 | 2 | 3 | 4 | 5 |
| 11. Helped plan activities around my exercise.   |  | 1 | 2 | 3 | 4 | 5 |

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 12. Asked me for ideas on how they can get more exercise. | 1 | 2 | 3 | 4 | 5 |
| 13. Talked about how much they like exercise.             | 1 | 2 | 3 | 4 | 5 |

**The questionnaire is now complete.  
Please hand in the questionnaire to the instructor.  
Thank you!**

**APPENDIX K:**

**Physical Activity Beliefs and Intentions Questionnaire**

## Physical Activity Beliefs and Intentions Questionnaire

Please answer the following questionnaire to the best of your ability. Take your time to think about your response to each question carefully and honestly before answering. Be sure to answer all the questions, and never circle more than one number on a given question. All responses will remain confidential and it will not reflect your grade in any way. If you have any questions about this questionnaire, raise your hand and an instructor will assist you.

Please fill out your grade, age, name, and e-mail (for tracking purposes only)

**Grade:**\_\_\_\_\_ **Age:**\_\_\_\_\_ **Name:**\_\_\_\_\_ **E-mail:**\_\_\_\_\_

*Regular physical activity is defined as activity done every day for at least 30 minutes in duration, and at a moderate to vigorous intensity. Some examples of physical activity include brisk walking, skating, bike riding, jogging, sports, gardening, dance, etc.*

### Physical Activity Beliefs:

*Rate the following statements on how you feel about regular physical activity by circling the appropriate response:*

(1) Doing regular physical activity over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely enjoyable	quite enjoyable	slightly enjoyable	neither	slightly unenjoyable	quite unenjoyable	extremely unenjoyable

(2) Doing regular physical activity regular over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely boring	quite boring	slightly boring	neither	slightly fun	quite fun	extremely fun

(3) Doing regular physical activity regular over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely unpleasant	quite unpleasant	slightly unpleasant	neither	slightly pleasant	quite pleasant	extremely pleasant

(4) Doing regular physical activity over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely important	quite important	slightly important	neither	slightly unimportant	quite unimportant	extremely unimportant

(5) Doing regular physical activity over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely harmful	quite harmful	slightly harmful	neither	slightly beneficial	quite beneficial	extremely beneficial

(6) Doing regular physical activity over the next 4 weeks would be:

1	2	3	4	5	6	7
extremely worthless	quite worthless	slightly worthless	neither	slightly valuable	quite valuable	extremely valuable

### **Social Influence:**

*Respond to the following statements as your social network (e.g. friends, family, co-workers) think about you participating in physical activity. Circle the number that best represents your answer.*

(1) Most people in my social network want me to be physically active over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(2) I feel pressure to engage in regular physical activity in the next 4 weeks from most people in my social network:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(3) Most people in my social network will pressure me to engage in regular physical activity over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(4) Most people in my social network will be physically active on a regular basis over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(5) Most people in my social network will not be physically active on a regular basis over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

### **Physical Activity Perceived Behavioural Control:**

*Respond to the following statements about the amount of control you believe you have over participating in regular physical activity over the next 4 weeks. Circle the number that best represents your answer.*

(1) I could be physically active every day over the next 4 weeks if I really wanted to:

1	2	3	4	5	6	7
extremely easy	quite easy	slightly easy	neither	slightly difficult	quite difficult	extremely difficult

(2) How much control do you believe you have over engaging in regular physical activity over the next 4 weeks:

1	2	3	4	5	6	7
very little control	quite little control	slightly little control	neither	slightly complete control	quite complete control	complete control

(3) There is very little I can do to make sure that I engage in regular physical activity over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

### **Physical Activity Intentions:**

*Respond to the following statements about your intentions to participate in regular physical activity over the next 4 weeks. Circle the number that best represents your answer.*

(1) I plan to be physically active every day over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(2) I intend to be physically active every day over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

(3) I will try to be physically active every day over the next 4 weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither	slightly agree	moderately agree	strongly agree

**The questionnaire is now complete.  
Please hand in the questionnaire to the instructor.  
Thank you!**

**APPENDIX L:**  
**Barriers and Facilitators to Physical Activity**  
**Questionnaire**

## **Barriers and Facilitators to Physical Activity Participation**

Please fill out your grade, age, your name, and e-mail address (for tracking purposes only)

**Grade:**\_\_\_\_\_ **Age:**\_\_\_\_\_ **Name:**\_\_\_\_\_ **E-mail:**\_\_\_\_\_

1. What were some of the barriers in participating in the physical activity program at the McKinnon Gym?

2. What were some factors that helped you participate in the physical activity program at the McKinnon Gym?

**The questionnaire is now complete.  
Please hand in the questionnaire to the instructor.  
Thank you!**

**APPENDIX M:**

**Physical Activity Readiness Questionnaire (PAR-Q)**

Please refer to the following reference:

CSEP. (2002). *PAR-Q and You*. Retrieved September 10, 2006 from

<http://www.csep.ca/communities/c574/files/hidden/pdfs/par-q.pdf>