

**The Impact of a Daily Physical Education Program on
Students' Attitudes Towards, and Participation in, Physical Activity**

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ABSTRACT

The goal of this study was to examine selected aspects of daily physical education programs in order to assess their relative student behaviour and attitude outcomes. Specifically, the purpose of this study was to determine if students involved in a program of daily physical education (DPE) exhibited more positive attitudes towards, and participation in, physical activity when compared to their peers involved in a non-daily physical education (NPE) program. It was hypothesized that the students involved in a daily physical education program would reap the benefits of regular physical activity to a greater degree than the non-daily physical education students and therefore develop a more positive attitude towards physical activity. Furthermore, by participating in physical education every day the students would see that physical activity is a valuable component of daily living. This recognition would serve as a foundation for a more positive attitude towards physical activity. Based on research that suggests that one's attitude will help predict his or her participation in physical activity (Smoll, Schutz, & Keeney, 1976) it was also hypothesized that the student's involved in a daily physical education program would exhibit greater levels of participation in physical activity in general.

A total of 295 students (N= 143 NPE students and N=152 DPE students) within two British Columbia school districts were used as subjects for this study. The subjects from both program groups were selected from classes taught by specialist teachers and were enrolled in schools that were similar in philosophy, facilities and socioeconomic status.

The student's attitudes were assessed using the Children's Attitude Towards Physical Activity Inventory (CATPA) (Schutz, Smoll, Carre, & Mosher, 1985). This inventory is based on Kenyon's (1968) early theoretical model that suggests attitude

towards physical activity is a multidimensional construct consisting of eight subdomains. The levels of participation in physical activity were assessed using the following two inventories: 1) The Leisure Time Exercise Inventory (Godin & Shephard, 1985) which has been validated and has shown strong test -retest reliability since its development. 2) The Physical Activity Questionnaire for Children (PAQ-C) (McGrath & Bailey, 1991) which is a more contemporary inventory provides detailed information regarding physical activity levels and patterns.

The results from the multivariate analysis of variance show an non -significant difference, $F(8,286) = 1.107$, $p < .369$, between the DPE and NPE student's attitudes towards physical activity. However, consistent with other research there was a significant multivariate F ratio, $F(8,286) = 6.831$, $p < .001$, for the gender main effect. There were two attitude domains (vertigo and aesthetic) that were responsible for the overall gender difference. The univariate F ratios suggest that the males had a more favorable attitude towards the risk taking and thrill aspects of physical activities when compared to females. Also consistent with past research it was determined that females had more favorable attitudes towards the aesthetic nature of physical activities. There was also a non-significant Program and Gender interaction suggesting that the differences between the males and females were generally the same for each program.

With respect to the levels of participation in physical activity, both inventories used were able to significantly differentiate between the Program and Gender groups. Multivariate analysis using both inventories showed significant F ratios, $F(2, 292) = 11.37$, $p < .001$ for the Program main effect and $F(2,292) = 22.654$, $p < .001$ for the gender main effect. The results suggest that the students involved in the daily physical education programs were more active than the students in non-daily physical education programs. Without any significant differences between the attitudes towards physical activity of each Program group and the fact that the attitude-involvement relationship was weak, $r = .16$ for males and $r = .10$ for females, it is difficult to explain the level of

participation differences between the two program groups. It may be that the students involved in the daily physical education program became conditioned to participate more in physical activities because of their regular physical education classes. In other words, physical activity became habitual for them and possibly because of their regular involvement they recognize the value and benefits of physical activity to a greater degree. Non significant differences in the attitudes towards physical activity between the two Program groups does not support this claim however.

Examination of the gender differences determined that the females were more involved than males in mild activities yet males were more involved than females in strenuous activities. The gender differences in physical activity levels and patterns identified in this study have been well established in the literature (Shephard, 1983). There was a non significant Program by Gender interaction. Analysis of the relationship between the two inventories gives preliminary support for the use of the PAQ-C inventory (McGrath and Bailey, 1990). It also suggests that both of the inventories primarily provide information on the levels of physical activity of moderate and strenuous intensities.

The findings of this study provide more support for daily physical education programs but researchers are encouraged to more closely examine the role of daily physical education programs on a number of related student outcomes because the results of this study are somewhat inconclusive. It is suggested that more attention be paid to both the specific curricular and instructional components of the program that affect the quality of the physical education experience prior to implementing the program on a daily basis.

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CHAPTER 1

INTRODUCTION

In recent years much progress has been made in raising the awareness of Canadians about the importance of physical activity and physical education at both the secondary and elementary school levels. In recognizing the physical, mental and social benefits of daily physical education many researchers and teachers in the area of physical education have been lobbying for an increase in the time allotted to Physical Education within the school curriculum (Hansen, 1990).

In 1986, the Canadian Association for Health, Physical Education and Recreation (CAHPER), in its attempts to improve the quality of physical education programs and time allotted to physical education, developed the School Recognition Award program. It recognizes and rewards schools who offer a "planned, quality program of instruction and activity for all students on a daily basis throughout the entire school year" (CAHPER, 1992). Schools with such a program are awarded Quality Daily Physical Education (QDPE) status.

The Quality Daily Physical Education School Recognition Program was based on recognition of the psychomotor, affective and cognitive benefits of daily physical activity and in particular, quality, daily, school-based physical education. With the advent of CAHPER's School Recognition Award (QDPE) additional emphasis has been placed on encouraging schools to implement a program of daily physical education. There are many barriers to implementing daily physical education such as scheduling problems, inadequate teaching resources, insufficient equipment and, lack of commitment from the teachers and administrators. Therefore, the benefits must be clearly identified, communicated and promoted (Hansen, 1990).

One of the first major studies to investigate the effects of a daily physical education program was the Vanves Project in France (MacDonald, 1961) where it was

reported that the experimental group of 30 students who followed a three year period of daily physical education were "happier, healthier, keener and had fewer disciplinary problems". The Vanves project stimulated numerous research studies that gave strength to the promotion of daily physical education (Coonan, 1978; Johnson, 1969; Martens, 1982; Sinclair, 1983; Williams, Hughes & Martin, 1982).

Johnson (1969) compared selected measures of students involved in a 2 day-a-week physical education program to students involved in a 5 day-a-week program and found that those students involved in a daily physical education class were superior in physical fitness, body fat measures and also in activity skill.

A study similar to the Vanves Project was conducted in an elementary school in Victoria and also reported encouraging results (Martens, 1982). Following a program of daily physical education the experimental group of Grade 4-7 students exhibited greater fitness levels, less body fat and a significant improvement in their attitudes towards physical education . These earlier studies served as a stimulus for further research and generated considerable interest in, and support for, daily physical education.

Other research studies have been reported that suggest students involved in a program of daily physical education also reap benefits such as optimal growth, resistance to disease and fatigue, improved cardiovascular fitness, improved academic achievement, greater weight control, improved self perception and image, and fewer disciplinary problems (Dahlgren, 1987; Hansen & McKenzie, 1988; Kirk, 1989; Martens, 1982; Siedentop & Siedentop, 1985; Sinclair, 1983). While the benefits of daily physical education and their positive effects on some student outcomes are well documented daily physical education exists in only a small percentage of the schools in Canada. Research that will identify the benefits of daily physical education in terms of other important student and program variables must be pursued in order to provide additional areas of support (Hansen, 1990).

Bain (1980) and other professionals in the field have suggested that the most important objectives of the school physical education program are to help students develop a positive attitude towards physical activity. The rationale for such goals is that if students are provided with valuable and enjoyable learning experiences on a daily basis they will learn to value and enjoy physical activity and will develop active lifestyles. Therefore, given that the development of a positive attitude towards physical activity is such an important objective of a physical education program and the fact that more research on daily physical education programs must be pursued, there is a strong need to investigate the impact of daily physical education programs on students' attitudes.

Tolson and Chevrette (1974) reported the effects of a six week daily physical education program on college student's attitudes towards physical activity. In comparing pre- and post-test scores of the experimental group it was discovered that the group receiving daily physical education exhibited an improvement in their attitudes towards physical activity. This provides initial support for the positive effect of daily physical education on attitudes towards physical activity. However, because it is important that children develop positive attitudes at an early age the impact of daily physical education on attitudes towards physical activity at this early age must be specifically investigated. Furthermore, the studies by Martens (1982) and Williams, Hughes, and Martin (1982) are the only projects that have presented daily physical education's effect on attitudes but their results were moderately significant at best. There is insufficient evidence to support claims that daily physical education can help improve students' attitudes towards physical activity and therefore there is a great need for this study.

The personal and social benefits of active living have been well documented and development of active lifestyles for children has been the goal of many public, private and school based programs. Much of the research has focused on the

psychological and psychosocial factors related to participation in physical activity. Dishman, Sallis, and Ornstein (1985) have reviewed much of the literature in the area and suggested that the determinants of exercise can be categorized into three groups: personal characteristics (motivation, attitude), environment characteristics (time, family and friends) and activity characteristics (activity intensity, perceived exertion). One's school based physical education program as a determinant of physical activity may be composed of any one or combination of those categories. The frequency and amount of organized physical education instructional time may affect any one of those personal characteristics such as one's enjoyment or perceived competence, and it may also relate to environmental aspects such as socialization with friends or access to facilities.

It is also the goal of the physical education program to have children become active participants in physical activities outside of the regular physical education instructional program. In fact, Koslow (1988) suggests that the primary goal of the physical education program should be to "socialize children into the role of active participants". Therefore it is important to investigate the impact of daily physical education on children's physical activity levels outside of the physical education class.

Dahlgren (1988), in her plea for support for QDPE, suggests that in addition to excessive enrollment, lack of resources and supplies, budgetary demands, and lack of support and commitment by the teachers and administrators, one of the greatest barriers to the promotion of daily physical education is the lack of comparative research on the benefits of implementing a program of daily physical education in terms of student outcomes and behaviors. It is suggested that data comparing daily physical education classes to non-daily physical education classes in terms of specific student variables is required. Positive results from a comparative study using two very important student outcomes - attitude towards physical activity and levels of physical activity - may provide some substantive rationale for implementing a daily physical

education program. Educators who make decisions regarding the implementation of school based programs must be aware of the extent to which daily physical education programs are achieving the curriculum goals compared to the conventional 2- or 3-day-a-week physical education programs.

Positive results from such an investigation may serve as justification for administrators, principals and teachers to adopt daily physical education programs and, in particular, achieve QDPE status. Also, the results from this study will also help to develop a clearer understanding of the determinants of childhood and adult participation in physical activities which is essential to ensure that people enjoy efficient, active and healthy lives.

1.1 Statement of Purpose

Both the development of a positive attitude towards physical activity and increasing the physical activity levels of children outside of the regular class instructional time are major goals of the physical education program. The impact of the daily physical education program on these two parameters was investigated in this study.

More specifically, the purpose of this research study was three-fold. However, the first two research questions were the primary interest and concern.

1) The first research question dealt with whether or not students who are involved in a program of daily physical education exhibit a more positive attitude towards physical activity than their peers involved in a typical, non-daily physical education program. Given that attitude towards physical activity is a multidimensional construct consisting of eight domains (Value of Health and Fitness, Enjoyment of Health and Fitness, Social Growth, Social Continuation, Catharsis, Vertigo, Aestheticism and Asceticism) (Schutz, Smoll, Carre & Mosher 1985) it must also be determined if the daily physical education program is more conducive to specific, or

combinations of different, dimensions of one's attitude towards physical activity when compared to a typical, non-daily physical education program.

2) The second research question dealt with whether or not students involved in a program of daily physical education exhibit greater physical activity levels outside of the regular physical education instructional program than their peers involved in a typical, non-daily physical education program

3) The third and secondary purpose of this research study was to investigate the attitude-behavior model as it relates to physical activity by determining if there exists a positive relationship between the students' attitudes towards physical activity and their levels of participation in physical activity. More specifically, the purpose is to determine that if one has a positive attitude towards physical activity will that individual exhibit greater levels of physical activity outside of the instructional program? Given that attitude is a multidimensional construct (Kenyon, 1968) it must also be determined which individual domain or combination of the attitude towards physical activity domains has the strongest relationship to students' participation in physical activity.

1.2 Hypotheses

This study consists of three specific research questions that are to be addressed. The following hypotheses related to each research question outlined in the purpose of the study. A brief rationale for each hypothesis will also be presented.

The first hypothesis deals with the first research question that examines daily physical education and student's attitudes towards physical activity.

1) It was hypothesized that the students involved in the daily physical education program will exhibit significantly more positive attitudes towards physical activity when

compared to their peers in non-daily physical education programs. The fact that daily physical education instills in students a greater awareness of the importance of physical activity has already been alluded to (Sinclair, 1983). Furthermore, recognizing the strong social attraction of physical activity it is assumed that students receiving that social interaction (i.e. chance to meet new children and opportunity to be with present friends) in the gymnasium or on the field on a daily basis will begin to develop a more positive attitude towards physical activity (Hansen, 1990). The fact that students receiving physical education every day will reap greater and more immediate benefits of physical activity than their peers in a non-daily physical education program must also serve as a strong rationale for this hypothesis. If daily physical education students are realizing the benefits sooner and to a greater degree then it follows that they will exhibit a more positive attitude towards physical activity.

The second hypothesis deals with the second research question that examines the effect of daily physical education on children's level of participation in physical activity.

2) It was hypothesized that the students involved in the daily physical education class will participate in physical activities outside of the regular class instructional time significantly more than their peers in the non-daily physical education program. Adams and Brynteson (1992) found that college alumni whose physical education activity (PEA) program required more frequent exercise realized the benefits of physical activity to a greater degree and were more aware of the importance of physical activity than those who were involved in a less frequent physical activity program. It was suggested that this knowledge and attitude towards physical activity that had presumably translated into greater physical activity levels which therefore provided initial support for this hypothesis. The assumption is that if students receive physical education on a daily basis the message conveyed to them will be that physical activity

is important. Furthermore, students will recognize the physical, emotional, mental and social benefits of physical activity if they receive physical education on a daily basis and are more likely to keep active outside of the school physical education instructional time. This assumption warrants investigation of the next research question and the hypothesis.

The third hypothesis dealt with the final research question that examined the attitude-behaviour relationship.

3) It was hypothesized that a positive relationship between attitude towards physical activity and participation levels in physical activities will be demonstrated. In fact, this hypothesis is the foundation for the preceding hypotheses because it must rely on the assumption that a positive attitude towards physical activity is a strong determinant of one's level of participation in physical activity. If daily physical education improves student's attitudes towards physical activity and this, in turn, improves their levels of participation then a positive attitude-behaviour relationship must be demonstrated. Smoll, Schutz and Keeney (1976) supported Kenyon's (1968) earlier study when they determined that there exists a "moderate relationship" between attitude towards physical activity and involvement. The results of these two studies provide initial support for this third hypothesis. In fact, Ajzen and Fishbein's (1980) review of 27 attitude-behaviour model studies reported that 26 of the studies had found that attitude did predict behaviour when the attitude measured had corresponded closely to the situation (behaviour) being considered.

1.3 Delimitations

1) It has been recognized that attitudes are generally formed at the ages of middle childhood (Ausebel & Sullivan, 1970) and therefore this study was limited to

grade seven students of the public schools from the two British Columbia lower mainland school districts.

2) All of the students involved in this study were taught by specialist physical education teachers (as defined in this study). Figley (1985) reported that the teacher has a very important role in the development of student's attitudes towards physical activity. Therefore, to ensure consistency and a sound research design there was a need to delimit this study to students taught by similarly qualified teachers. Therefore, the effects of teachers in explaining any attitude or participation differences between the two program groups (daily physical education and non-daily physical education) is controlled.

1.4 Assumptions

1) In determining the impact of daily physical education on student's attitudes towards, and participation in, physical activity it was assumed that there is very little contamination of student's attitudes towards physical activity and physical activity behaviours by the student's involvement in any other non-physical education physical activity programs. In other words it was assumed that the student's involvement in the physical education program, as opposed to any other youth physical activity program, is the primary factor in the development of a positive attitude towards physical activity and development of an active lifestyle.

2) It must also be assumed that the students are not attending specific schools because of the type of physical education program that exists. Otherwise, it might be deemed that the students may already be predisposed to specific physical activity behaviours or specific attitudes towards physical activity.

3) It was also assumed that participation physical activities outside of the physical education program was similar for both the daily physical education and non-daily physical education students.

1.5 Limitations

1) The nature of this project did not allow for an investigation of the parameters or mechanisms (frequency, duration, and modification of activities due to time and frequency) within a daily physical education program that may contribute to the differences in participation and attitudes. Instead the intent of this study was to provide some general information about the benefits of the daily physical education program in terms of attitudes towards physical activity and participation levels.

2) This study was limited to measuring attitudes and physical activity behaviours at one certain point and omits pre- and post-test scores that would allow for an intervention study. Instead this study compares the attitudes towards physical activity and participation levels of daily physical education students to non-daily physical education students.

3) There are so many determinants of student participation in physical activity (Dishman et al., 1985) that it is very difficult to attribute all of any differences in the attitudes towards, and participation in, physical activity between the two groups of students exclusively to the type of program. However, given that all of these determinants generally remained consistent throughout the two groups it was easier to identify the program type as the primary differentiating factor.

1.6 Definition of Terms

1) Daily Physical Education Program

A planned physical education program in which the students receive a minimum of 150 minutes of instructional time in one of the following situations:

- i) Class instruction every day
 - ii) Classes 4 days each week supplemented by an active health class on the other day i.e. Fitness, Nutrition, Safety, Sports and Leisure
 - iii) Classes 4 days each week supplemented by a school wide activities i.e. special days such as swimming or skating programs blocked into the timetable.
- Note: these activities must have pre-defined instructional objectives and not consist of free play.

* These criterion are adaptations from the criterion in the CAHPER's Quality Daily Physical Education Award Program (CAHPER, 1992).

2) A Non-Daily Physical Education Program

A physical education programs in which the students receive a maximum of 100 minutes of instructional time in one of the following situations:

- i) Classes 2 days each week (30-40 minutes/class)
- ii) Classes 2 days each week supplemented by 30 minutes of active health or a special, school wide physical activity that has predetermined instructional objectives and does not consist of free play.

*3) Physical Activities

Refers to games, sport, dance and outdoor pursuits such as bike riding, hiking, soccer, swimming, street hockey, jogging, walking, skateboarding, gymnastics, and jazz that may or may not be a part of organized programs such as physical education classes, school sports, or community sports.

*This definition is a modification of the definition provided by Simon and Smoll (1974) in their Children's Attitudes Towards Physical Activity (CATPA) Inventory

4) Specialist Physical Education Teacher

A specialist physical education teacher is identified for the purposes of this study as a teacher whose major discipline in their undergraduate degree was Physical Education.

5) Active Health

Active Health, as it relates to the physical education curriculum, implies learning about some of the academic content related to this concept. This would include topics such as exercise physiology, general health, nutrition, athletic therapy and the study of the practical applications of each.

CHAPTER 2

REVIEW OF LITERATURE

The following chapter consists of a comprehensive review of the literature available to justify the hypotheses of this thesis. The review will highlight some of the experimental designs and findings of research studies that relate to this study. This review examines the literature related to the three hypotheses. This review is broken up into four separate sections each of which include some sub-sections.

1) Since the primary goal of this research study is to investigate the impact of daily physical education on both attitude towards physical activity and levels of participation in physical activity the first section will be devoted to a general review of all the daily physical education literature. Both historical and more contemporary studies and published articles that discuss the benefits of daily physical education and barriers faced in implementing daily physical education programs will be examined in this introductory section.

2) The second section consists of a thorough examination of the attitude towards physical activity (ATPA) research with specific emphasis on attitude development and measurement . The investigation of gender differences also requires an understanding of the literature on attitude formation and expressed attitudes.

The literature relating to the first hypothesis that examines the impact of daily physical education on student's attitudes towards physical activity will also be presented in this section.

3) The third section of this review examines the literature on the determinants of physical activity and the measurement of physical activity. It is important to

understand what makes children active (and how this activity is measured) before a physical education program's effect can be investigated.

Literature relating to the second research hypothesis that examines the effects of daily physical education on children's physical activity levels and patterns will also be presented in this section.

4) The fourth and final section will review the literature on the attitude-behavior relationship that is the focus of the third hypothesis. This will include one sub-section that will examine the generic attitude and behavior relationship discussed in the psychosocial literature. The other sub-section will examine children's attitudes towards physical activity and their involvement in physical activity.

2.1 Daily Physical Education Literature

To give support for daily physical education and help promote CAHPER's Quality Daily Physical Education initiative many researchers and practitioners have outlined the general benefits of physical activity. Hansen and McKenzie (1988) suggest that we can simply emphasize the benefits of "regular" physical activity and then the extra benefits of "daily" physical activity will be recognized. This is based on the premise that the benefits of regular physical activity will seemingly increase or be accentuated if the activities are pursued on a daily basis. Corbin (1986), in his attempts to promote the inclusion of daily physical education into the elementary and secondary curricula, outlines some of the benefits of regular physical activity. He concluded that participation in physical activity promotes the development of cardiovascular fitness, promotes optimal physical growth, improves one's weight control and improves one's resistance to disease and fatigue (Corbin, 1986). Robbin's study (1987) suggested further that participation in physical activity improves children's social skills and helps them to more effectively cope with stress. Shephard

(1983) added to this list of benefits stating that participation in physical activity increases knowledge and understanding of healthy lifestyles which may translate into one's adherence to an active, healthy lifestyle given that attitude does predict behavior. These findings provide support for the hypothesis that daily participation in physical activity will improve students' attitudes towards physical activity.

In recognizing the benefits of regular physical activity many physical educators began to promote the inclusion of "daily" physical education into the curriculum. The Vanves Project in France (MacDonald, 1961) was probably the most important contributor to the promotion of daily physical education (Pollatschek, 1989) . The

French Ministry of Education set up its own experiment in which a control group of 30 grade six and seven students received the regular amount of physical education (less than 90 minutes each week) prescribed in the school curriculum and an experimental group of the same number received 2 hours more of physical education each day. At the end of the three year experimental period the experimental group was reported to be "happier, healthier, keener and had fewer disciplinary problems" than the control group (MacDonald, 1961). Greater improvements in physical growth were also experienced by the experimental group. It was also found that the experimental group, despite less academic time, displayed equal or better academic records.

A similar study comparing the effects a 5-day-a-week to a 2 or 3-day-a-week physical education programs on fitness, skill, adipose tissue and growth presented results that were also in favor of daily physical education (Johnson, 1969). Both groups were involved in similar programs for a period of two years. Students were measured using a skills test and fitness test battery and the triceps skin fold was assessed to approximate the amount of subcutaneous adipose tissue. In comparing the post-test results of all the subjects it was determined that the students receiving daily physical education were "superior in physical fitness, activity skill, and had less

subcutaneous fat". There were, however no significant differences in the growth curves (Johnson, 1969).

Shephard (1977) was also impressed by the results of the Vanves project and designed a similar study which has served as the bench-mark against which many other studies were based. This study consisted of an equal number of students (N=600) in control and experimental groups enrolled in a number of schools. The control group received the normal amount of physical education which was usually 1-2, 45 minute classes each week and the experimental group received one hour each day. The content of the programs was decided upon by each of the physical education specialist teachers within each of the schools although they were given some flexible guidelines. In all schools the experimental groups reported superior scores on most measures of physical and physiological performance following the six year period of this study (Shephard, 1977). The aerobic power and strength measures best discriminated between the two groups in favour of the daily physical education group. In some schools superior academic scores were reported by the experimental groups.

Many regional and national studies in Canada attempted to replicate the Vanves Project and in all cases similar findings were made (Kirk, 1989; Martens, 1982). One such study in Blanshard Elementary School in Victoria, British Columbia found positive results when the primary and intermediate aged students were involved in a physical education program in which a third of the day was devoted to physical education instruction or physical activity participation (Martens, 1982). Another component to this program was the inclusion of an active health lesson offered every six weeks focusing on the effects of exercise on the body's systems. In comparing pre-test results with post-test results over a four year period for all students it was reported that those students involved in the daily physical education program exhibited greater fitness improvements and also they exhibited more positive attitudes towards physical education and their school work in general. Also, academic

performance had either been maintained or had improved and presumably as a result of the other benefits the student's self confidence had improved. In this study it is interesting to note that all of the teachers were generalists and therefore a substantial amount of in-service physical education training was conducted (Martens, 1982). One may question whether or not the benefits would have been accentuated had the teachers been specialists.

A daily physical education pilot project was initiated by the Vancouver school board to determine the effects of daily physical education on the physical fitness, physical motor skills, academic achievement and attitudes toward physical education of 462 students (227 females, 235 males) in grades 2, 4 and 6. After the two year period of the study both of the groups (control and experimental) exhibited gains in all measures, however, the experimental group receiving 30 minutes of physical education for each day of the week exhibited gains that exceeded those exhibited by the students in the control group who received only 2 periods of 30 minutes on 2 days of the week. The differences in mean scores that favored daily physical education students were as high as 19 percent in the psychomotor domain performance measures, 8 percent in the affective domain performance measures and 41 percent in the cognitive domain performance measures (Sinclair, 1983).

Australian studies have also provided support for daily physical education. In many of their studies that replicated the Vanves project the results were in strong support of daily physical education (Coonan, 1978; Kirk, 1989; Siedentop & Siedentop, 1988).

Pollatschek and O'Hagan (1989) investigated the influence of a daily physical education program on physical and psychological measures of 222 primary school children in England. The students who participated in the daily physical education program consisting of a minimum of 30 minutes of physical education each day improved their fitness to a greater degree than the non-daily physical education

program students. They were also superior to the control group in motor fitness, attitudes towards school and school performance.

Hansen and McKenzie (1988) cite Dr. Noel Grace from the Ontario Medical Association when he reports the results of a study comparing students in a daily physical education program to those in a typical physical education program. The results from Grace's unpublished study suggest that the students receiving daily physical education got sick less often, had fewer disciplinary problems and their academic record was equal or better than their peers in the non-daily program of physical education. This was a simple comparative study wherein the school records (absences, behavior discipline, and academic records) of all involved subjects were quantified and the two groups were compared. Dahlgren (1987) found similar results in a study and also that the students in daily physical education showed "less absenteeism and greater productivity in their academic work".

2.2 Attitude Towards Physical Activity : Measurement and Development

One of the major goals of physical education programs is the development of positive attitudes towards physical activity (Bain, 1980). It is the goal of the physical education program that the children begin to enjoy and recognize the value of physical activity as a result of their physical education class involvement. The assumption and the hope of physical education teachers is that these students, as a result of this attitude improvement, will then develop more active lifestyles (Bain, 1980). The implication, therefore, is that improving student's attitudes towards physical activity is an important objective of the physical education program and in advocating daily physical education many researchers and physical education teachers in the field suggest that regular physical activity helps shape positive attitudes towards physical activity (Corbin, 1986; Godin & Shephard, 1986; Robbins, 1987). Given that a student's attitude towards physical activity is important it is essential that

researchers investigate and develop a greater understanding of those factors that inhibit and promote the development of a positive attitude towards physical activity. The research on students' attitudes towards physical activity has examined the effect of a number of school related variables on children's attitudes towards physical activity. The role of the teacher (Patterson & Faucette, 1990), the impact of previous physical education program (Adams & Brynteson, 1992), the value of a six week daily physical education program (Tolson & Chevrette, 1974) have all been investigated for their effect on individuals' attitudes towards physical activity. Certainly more research on the different aspects of the physical education instruction and curriculum and their effect on student's attitudes towards physical activity needs to be pursued.

The development of Kenyon's Attitude Towards Physical Activity Inventory (1968) generated a lot of research into the area of attitude and its relationship to many other situational and dispositional variables (Schutz, Smoll, & Wood, 1981). This inventory was based on the theoretical construct which represents attitudes towards physical activity as multidimensional. In other words, physical activity consisted of six domains; social continuation, health and fitness, aestheticism, asceticism, vertigo, and cathartic. Therefore, an individual could hold a different attitude towards each individual domain.

Using Kenyon's Attitude Towards Physical Activity Inventory (Kenyon, 1968), Eastgate (1975) investigated the attitude differences between female and male participants in a middle school extramural sports meet while Leonard (1975) investigated attitudes towards physical activity as a result of religious affiliation. Using the same inventory, Tolson and Chevrette (1974) reported the effects of a six-week daily physical education program on college students' attitudes towards physical activity. The inventory was able to discriminate between the pre- and post-intervention scores indicating that the students exhibited an improvement in their attitudes towards physical activity. Recognizing the importance of investigating

children's attitudes Simon and Smoll (1974) developed a psychometrically sound inventory for the assessment of children's attitudes towards physical activity (CATPA) based on the same theoretical construct developed by Kenyon (1968). This inventory was used to examine the relationship between attitudes, involvement in physical activity, and motor performance of 264 students (Smoll, Schutz, & Keeney, 1976). The findings determined that a strong relationship between attitude towards physical activity and a combination of the children's involvement and their proficiency in sports existed (Smoll, Schutz, & Keeney, 1976).

Smoll and Schutz (1980) conducted a longitudinal analysis of children's attitudes towards physical activity using the CATPA inventory (Simon & Smoll, 1974). The results indicate stability in group attitude scores but correlational analyses revealed an instability of attitudes towards physical activity within individuals across grade. It was also revealed that children's attitudes towards physical activity is not an enduring behavioural disposition over time. Using this inventory Schutz, Smoll and Wood (1981b) assessed 550 young male and female athlete's attitudes towards physical activity and their attitudes towards a specific sport. They concluded that children's attitudes towards a specific sport are essentially the same as their attitudes towards physical activity as a general term (Schutz, Smoll, & Wood, 1981b).

Based on Wood's (1979) analysis of the psychometric properties of the CATPA inventory it was refined by Carre, Mosher and Schutz (1980) to make it shorter, more practical and more psychometrically superior. This revised CATPA inventory was used to assess the attitudes towards physical activity of 1050 male and female students as part of the British Columbia Physical Education Assessment Project (Carre, Mosher, & Schutz, 1980). The children's attitudes towards physical activity were generally positive for both sexes but there were some gender differences in the mean scores for the attitude sub domains. The females exhibited more positive attitudes towards physical activity as expressed in all domains with the exception of vertigo and ascetic.

For the males the domain for which they held the least positive attitude towards was the aesthetic. Given this study and others that have investigated gender differences it can be concluded that it is difficult to identify any significant differences in general attitudes because multivariate analyses have not been conducted. However, there are significant differences in the domains for which males and females hold the most positive attitude towards physical activity.

Schutz, Smoll, and Wood (1981a) conducted a psychometric analysis of the revised inventory and determined that with the new scoring procedures and the additional domains it was more psychometrically sound. They confirmed the recommendations endorsed by Carre, Mosher, and Schutz (1980) and derived others based on their psychometric analysis. This new inventory was used in a study to investigate the stability of children's attitudes towards physical activity over time (Schutz & Smoll, 1984). They found more stability in the attitude towards physical activity of secondary students and confirmed earlier findings that suggest younger children's attitudes are unstable over time. The CATPA inventory was revised once again to include more domains for scoring purposes and make it psychometrically superior (Schutz, Smoll, Carre, & Mosher, 1985).

Patterson and Faucette (1990) recently compared the attitudes of children towards physical activity when taught by physical education specialist teachers versus non-specialist teachers using the Revised CATPA inventory (Schutz, Smoll, Carre, & Mosher, 1985). Although discriminant function analysis resulted in a significant difference between the two groups, statistical analysis suggested that only 4 percent of the variance of attitude scores was explained by the teacher. This study reiterates the need for future attitude research and has shown that the revised CATPA inventory is a reliable tool with some discriminating potential.

Birtwistle and Brodie (1991) assessed 291 secondary and 316 primary students attitude towards physical activity using the revised CATPA inventory as a means

towards developing a school based health promotion model. There was a significant difference in the attitudes towards physical activity of males and females but no differences in the attitudes between the socioeconomic status levels.

2.2.1 Daily Physical Education and Student's Attitudes

It has been reported that regular physical activity helps shape positive attitudes towards active, healthy lifestyles (Corbin, 1986; Robbins, 1987; Shephard, 1983; Sinclair, 1983). Susust (1987) studied Grade 5 students' attitudes towards physical activity after they had been involved in a daily physical education program for 16 months. Although there were no pretest scores to compare the results to, ninety-four percent of the children involved in the daily physical education program were either happy or very happy about taking part in physical activity "in order to make them healthy". Ninety percent of the children were either happy or very happy about participating in physical activities "which get their body in better condition". Questions posed to the children were modifications to the statements in the revised Children's Attitude Towards Physical Activity (CATPA) inventory identified in Schutz, Smoll, Carre and Mosher (1985). The results suggest that children had developed a firm understanding of the importance of physical activity to health and physical condition. Using the original ATPA inventory (Kenyon, 1968) , Tolson and Chevrette (1974) examined the effects of a six-week daily physical education program on college students' attitudes towards physical activity. The inventory was able to discriminate between the pre- and post-intervention scores and the results suggested that the students had exhibited a significant improvement in their attitudes towards physical activity.

Williams, Hughes, and Martin (1982) used a modification to the CATPA inventory (Simon & Smoll, 1974) to assess the effects of a 10 week daily physical education program on student's attitudes towards physical activity. They reported that

students who already exhibited high attitudes towards physical activity showed no significant differences . However, those with low levels of attitudes towards physical activity showed a weak, yet significant, improvement.

Adams and Brynteson (1992) investigated the exercise habits and attitudes towards physical activity of college alumni who were involved in physical education programs with various durations and frequencies . A sample question such as " To what extent do you consider exercising 3 or more times a week an important method of maintaining your health?", was also responded to by the subjects. Those individuals receiving more physical education activity during their college years responded more positively to this question. This suggests that a daily physical education program may positively affect one's attitudes towards physical activity.

However, there has not been any research to date that has investigated the impact of daily physical education programs by teachers on elementary aged students' attitudes towards physical activity by comparing a daily physical education to a non-daily physical education program. Moreover, there has not been any research that attempted to identify those features of a physical education program that are most conducive to the development of a positive attitude towards physical activity.

2.3 Participation in Physical Activity

There is evidence to suggest that increased levels of participation in physical activity and exercise programs are associated with improved health (Blair et al., 1985). The personal and societal benefits of good health are well documented so research attempting to identify those factors that most contribute to active lifestyles must be pursued if optimal health is to be achieved through physical activity. Dishman, Sallis, and Ornstein (1985) reviewed the scientific literature on known determinants of regular exercise and categorized them into personal characteristics, environmental characteristics, and activity characteristics. Examples of each are as follows

Personal Characteristics

Past program participation, occupation, smoking, overweight, youth sport, age, self-motivation, knowledge and attitudes, perceived physical competence and enjoyment of activity.

Environment Characteristics

Spouse support, perceived available time, access to facilities, family and peer influences, disruptions in routines, school athletics program.

Activity Characteristics

Activity intensity, activity length, nature of activity (i.e. invasive versus non invasive sports; individual versus team activities), perceived exertion.

Dishman, Sallis, and Ornstein (1985) included attitude towards physical activity as one of the "*personal*" determinants of participation in physical activity. This is further support for the investigation of the effect of attitude towards physical activity on the level of participation in physical activity.

It has been reported that the physical activity patterns of children have proved to be predictors of adult physical activity patterns (Powell & Dysinger, 1987). Powell and Dysinger (1987) investigated the impact of both childhood participation in organized sport programs and physical education on levels of adult physical activity through their review of literature . They found that although a weak, yet positive relationship exists, the necessary concern about the determinants of both childhood and adult physical activity participation has not been addressed in the literature.

If an active lifestyle in adulthood is a major goal of the school based physical education program then the determinants of childhood physical activity patterns need to be specifically determined through research studies. Unfortunately, there has been little research investigating the impact of physical education programs on childhood

participation in physical activities outside of the physical education class (Dishman, 1988).

Adams and Brynteson (1992) investigated the current exercise habits of college alumni to determine if there was a relationship between their levels of physical activity (measured in hours per week) and the amount of physical education that was required of them in college. Their results suggest that those alumni who had more physical education time and a greater frequency requirement exhibited more active lifestyles. The researchers suggest that this is because the students were receiving more physical education activity and the importance of physical activity was more strongly instilled in them. The subjects' attitudes towards physical activity were also measured using a number of questions that the subjects responded to using a typical Likert scale. A question such as, "To what extent do you consider exercising 3 or more times a week an important method of maintaining your health?" was included in the questionnaire. Those individuals receiving more physical education activity responded more positively to this question. Their results are consistent with a 1980 study by Rasmussen (cited in Adams & Brynteson, 1992) which indicated that students receiving increased time allotments of physical education were more supportive of an active lifestyle. They indicate that controlled behavioral interventions in school settings can be associated with "increased frequency, intensity, and duration of physical activity, and in some cases desirable health outcomes". However, they do not consider the specific impact of the elementary physical education curriculum, frequency, and time allotment on students' attitudes towards physical activity.

Dishman (1988) has reviewed much of the research on exercise and physical activity adherence in children and youth and he too suggests that "youth experiences in sport and physical education" and the specific components of the physical education must be investigated as determinants to both childhood and adult activity

patterns. The results from an earlier study by Montoye (1986) are also in support of the plea for more research on the impact of physical education programs.

2.3.1 Measurement of Physical Activity Levels

Past research on physical activity patterns and participation rates has used a variety of questionnaires and inventories to assess physical activity. Self recorded diaries and more advanced objective measures such as direct observation have also been used to assess physical activity levels (McKenzie et al., 1991). In addition, heart rate monitoring, motion sensors (Freedson, 1991) and Caltrac accelerometers (Sallis et al., 1991) have been used in research to assess activity levels but, because of expense, are rarely used. The majority of studies attempting to use self reporting measures to assess physical activity participation rates have used energy expenditure (kcal/week) as the scale (Wachburn & Montoye, 1986). Recently more descriptive measures generating information such as the type of physical activities participated in, the time of day subjects are most active, the nature of the activities that they participate in are being used as scales (McGrath & Bailey, 1990). In particular, the PAQ-C inventory has been designed specifically for children and takes a more descriptive approach to measuring activity patterns. This allows the researcher to attain more descriptive measures of physical activity than the traditional physical activity inventories such as the Leisure Time Exercise Inventory (LTEI) (Godin & Shephard, 1984).

The Leisure Time Exercise Inventory (Godin & Shephard, 1984) is a simple 7 day exercise recall inventory that has been validated and utilized in previous research projects. Completion of this inventory generates a weekly (7 days) activity score based upon the reported frequency of exercise at three intensity levels (mild, moderate, strenuous) multiplied by the corresponding anticipated multiples of resting energy expenditures (3, 5 or 9 METS). This inventory is simple to use and gives quantitative

information about the intensity of the physical activity levels but lacks the specific data required for more thorough, descriptive analyses. A more thorough discussion of these instruments is included in sections 3.2.3 and 3.2.4.

2.3.2 Daily Physical Education and Levels of Physical Activity

To date there is no reported literature that cites studies investigating the effects of daily physical education on physical activity levels of school aged children. However, Adams and Brynteson (1992) found that college alumni that had more physical education in their college years were more active after graduation. Although this does not directly relate to Grade 7 students' participation levels it does provide some evidence that physical education may be related to future physical activity levels and patterns.

2.4 Attitude Behavior Relationship

The underlying assumption in the attempts to improve students' attitudes as well as other research that attempts to identify those features of a physical education program that are most conducive to the development of a positive attitude towards physical activity is that student participation in physical activities will increase and become more meaningful . Why would physical educators concern themselves with the development of positive attitudes if they do not know that behavior is to be altered positively as a result ? Therefore, research on student attitude relies heavily upon the model that suggests attitude predicts behavior (Kenyon, 1968).

2.4.1 Theoretical Investigation of the Attitude-Behavior Model

The relationship between attitude and action has been the focus of extensive research in social psychology. Originally, attitude was thought to be the most important factor in determining behavior (Ajzen and Fishbein, 1977) but subsequent

research found that existing attitude measures were unable to predict behavior. After years of discouraging results in testing this model Ajzen and Fishbein (1980) finally provide some encouragement to the model. They had redefined the concept of attitude to include both an "affective and action" element. Therefore, their research was now concentrating on the action element of attitude and attempting to relate it to a specific related action. For example, one individual may hold a positive attitude towards school, recognizing its importance and value but one's attitude towards (the action element) doing the school work may be significantly different and presumably lower. In this case in order to strengthen the attitude behaviour relationship one's attitude *towards* doing the school work has to be considered in order to develop a positive relationship between the behaviour related to school. Therefore, it is suggested that research should attempt to assess people's attitudes towards specific objects, at specific times, in a specific context towards a specific action (Ajzen & Fishbein, 1977). The research that considers this new "action" component of an attitude construct has shown a positive attitude-behaviour relationship (Ajzen & Fishbein, 1977).

2.4.2 Attitude Towards Physical Activity and Levels of Participation

In his early study, Kenyon (1968) found that using his Attitude Towards Physical Activity inventory there existed a "low to moderate" association between participation in physical activity and positive attitudes towards physical activity. Simon and Smoll (1974) used a questionnaire with forced choice items to collect data on involvement in different types of physical activity and the attitudes towards physical activity were assessed using the original CATPA inventory (Simon & Smoll, 1974). Their results offer preliminary support to the attitude behaviour relationship suggesting that the relationship was significant yet very low. Schutz, Smoll and Keeney (1976) found, using the original Children's Attitude Towards Physical Activity inventory, there

was a significant relationship between a student's attitude and involvement domains of physical activities but it too was statistically low.

The new "action" element of attitude endorsed by Ajzen and Fishbein (1977) led to the redefinition of attitude towards physical activity (ATPA) to the new attitude *towards* participating in physical activities that is addressed in the revised CATPA inventory (Schutz, Smoll, Carre, & Mosher, 1985). In their assessment of the attitude behaviour relationship using the CATPA inventory that did not include the action element Schutz, Smoll and Wood (1981a) reported results that support previous research that suggest the relationship is either significant but very low or non significant. In this particular study using a revised version of the original CATPA inventory (Simon & Smoll, 1974) it was reported that less than 10 percent of the variability in the involvement scores can be attributed to attitude scores.

In their study of the stability of youths' attitudes towards physical activity, Schutz and Smoll (1984) questioned the relationship between attitude and involvement. In determining the correlation of data on the physical activity involvement to the data on attitudes towards physical activity they found the relationship to be weak at best. In fact, best results (those for Grade 10 females) suggest that only 22.8 percent of the variability in the level of physical activity involvement can be explained by the attitude towards physical activity. The Children's Attitude Towards Physical Activity inventory that was used in this 1984 study had not been revised to include the action element (i.e. revised to determine one's attitude *towards* participating in physical activity) that was advocated by Ajzen and Fishbein (1977).

To date no other research investigating the relationship between attitude towards physical activity and participation has been reported. Therefore, further investigation of this model is warranted.

CHAPTER 3

METHODOLOGY AND PROCEDURES

3.1 Initial Contact and Sample Selection

The Ethics Review Committee at the University of British Columbia initially provided permission to conduct a research study involving human subjects (Appendix A). Subsequently, the Burnaby School District and the Coquitlam School District were contacted to seek support for the collection of data in their schools (Appendix B). These two school districts were selected due to their previous support of similar studies and the fact that their physical education teachers sharing the same District Curriculum and Instruction Manual. Both districts also employed Physical Education Specialist teachers which was one of the requirements for the sample population. Each of the school districts gave their permission for the study and were supportive in the identification of schools for sampling.

The sample population (N=297) for this study was selected from 5 intact classes of grade seven students in five schools with a program of daily physical education programs and from five schools with non-daily physical education programs. Prior to identifying the participating schools and classes it was necessary to apply some restrictions to the schools and classes selected. It was essential that the two groups of students (daily and non-daily) were involved in similar (other than time allotment and frequency) physical education programs to reduce the attribution of any attitude or participation differences to factors other than the amount and frequency of their physical education classes. Therefore, in selecting the sample population for this research the following requirements had to be met to ensure that a sound research design was followed.

3.1.1 School Requirements

1. Each school involved had a maximum enrollment of 375 students. This was necessary since a large student enrollment is a major barrier to the implementation of a daily physical education program because of the scheduling difficulties it creates (Hansen, 1990). Furthermore, often excessive enrollment creates unequal class sizes between the daily and non-daily physical education programs which would interfere with the standardization of the sample population. Therefore, in consultation with the District Physical Education Coordinator it was decided that schools with more than 375 students would not be considered for this study.

2. Each of the classes within all 10 of the schools were taught by a physical education specialist teacher. There is a great deal of literature that attempts to define a specialist physical education teacher but there does not seem to be one clear definition that everyone can agree upon (Patterson & Faucette, 1990). The definition of a specialist may vary from one school district to another and therefore, for the purpose of this research study some criteria were established that teachers had to meet before they could be labeled as a specialist and selected for sampling (see Definition of Terms for description).

3. Each school physical education program (Daily PE and Non-daily PE) was in operation for a minimum of two years. This ensured that the impact of each program would be realized over time.

4. Each of the schools were similar in terms of enrollment, proximity to community facilities, provision of intramural and extra-curricular physical activities, regional location, general socioeconomic status of the community, and availability of facilities, equipment, supplies and resources within the district and schools . The

study's requirements for and selection of the physical education programs was achieved in consultation with the Physical Education Coordinators from each School District.

3.1.2 Program Requirements

*1. Each of the daily physical education programs in which the students were enrolled consisted of a minimum of 150 minutes of instruction in one of the following situations:

- i) Class instruction every day
- ii) Classes 4 days each week supplemented by an active health class on the other day i.e. Fitness, Nutrition, Safety, Sports and Leisure
- iii) Classes 4 days each week supplemented by school wide activities i.e. special days such as swimming or skating programs blocked into the timetable. Note: these activities must have pre-defined instructional objectives and not consist of free play.

* These criterion are adaptations of the criterion from the CAHPER's Quality Daily Physical Education Award Program (CAHPER, 1992).

2) Each of the non-daily physical education programs in which the students were enrolled included a maximum of 100 minutes in one of the following situations:

- i) Classes 2 days each week (30-40 minutes/class)
- ii) Classes 2 days each week supplemented by 30 minutes of Active Health or a special, school wide physical activity that has predetermined instructional objectives and does not consist of free play.

3.1.3. Subject Requirements

1. To ensure that the effects of each respective program were realized each student had to have been involved in their respective program for a minimum of two consecutive , complete school years.

2. Students within each sample school were taught by the same specialist Physical Education teacher and came from intact classes. Some subjects had different classroom teachers but were taught by the same specialist physical education teacher.

3. Each student understood the instructions contained in the data collection instrument. Students with English as their second language (ESL students) and students with learning or hearing disabilities received help from their peers, teacher or teacher's aid in their interpretation of the instruments.

In consultation with the Physical Education Coordinator from each district, schools that met the criteria established in categories 3.1.1, 3.1.2 and 3.1.3 were identified and selected for data collection (Appendix C).

These schools were contacted by a letter seeking support for their involvement in the study. Each of the letters was followed up by a telephone call to the principals to confirm their support and make initial contact with the cooperating grade seven teacher(s) at each school (Appendix D).

A convenient time to survey the students was agreed upon once final approval had been given from the Principals and cooperating teachers. It was very important to the success of this study that the time of day that each class was surveyed was similar as it is possible that students may respond differently to an attitude inventory at different times of the day. For example, a subject may express a slightly different

attitude towards physical activity first thing in the morning upon arrival at school when compared to the response the subject may have after a lunch hour of fun and games. It was also important that all of the schools were surveyed over as few days as possible. Since the students were reporting activity levels for the previous seven days as well as expressing their attitudes towards physical activity it was important that they did this under the same weather conditions as this may be a determinant of how active they were, and what activities they pursued that week. It was also important that they were reporting from a similar portion of the same seven day period in the event that there were any community physical activity events occurring in that seven day period.

The eligible students in each of the participating classes were given parental consent forms that they took home and had their parents sign (see Appendix D). The consent forms were returned to the school prior to the data being collected at their school and only those students that had returned the consent forms were included in the study.

A total of 297 students (Females=139, Males=158) taught by a total of ten specialist teachers met all of the criteria and were included in this study.

3.2 Data Collection Instruments

Data for this study was collected through the use of three instruments. First, to generate information on student's attitudes towards physical activity data was collected using the revised Children's Attitude Towards Physical Activity Inventory (CATPA) Inventory (Schutz, Smoll, Carre, & Mosher, 1985). Second, to obtain information on the physical activity levels of these students, data was collected using the Physical Activity Questionnaire for Children (PAQ-C) (McGrath & Bailey, 1990) and the Godin-Shephard Leisure Time Exercise Inventory (Godin & Shephard, 1984)

3.2.1 Children's Attitude Towards Physical Activity Inventory

The students' attitudes were assessed employing the revised Children's Attitude Towards Physical Activity (CATPA) Inventory (Schutz, Smoll, Carre, & Mosher, 1985) (Appendix G). This inventory was developed from the same theoretical construct as Kenyon's Attitude Towards Physical Activity (ATPA) Inventory which viewed attitude towards physical activity as a multidimensional construct (Kenyon, 1968). In other words, attitude towards physical activity, the construct, consists of eight domains: social growth, social continuation, fitness for value, fitness for enjoyment, vertigo, catharsis, aestheticism and asceticism. The original CATPA Inventory (Simon & Smoll, 1974) although revised many times to strengthen its psychometric properties has stimulated a substantial amount of attitude research which recognizes that the development of a positive attitude towards physical activity is very important. Smoll, Schutz, and Keeney (1976) have used this instrument to examine relationships among attitudes, involvement and proficiency in physical activities. Smoll and Schutz (1980) pursued further work with this instrument in their examination of the stability of attitudes over an extended period of time. A revised CATPA inventory was also used in the British Columbia Physical Education Assessment to assess students of all grade levels (Carre, Mosher, & Schutz, 1980). A 1982 New Zealand study used the CATPA Inventory to investigate the effect of a ten-week physical education program on a total of 251 students' attitudes towards physical activity (Williams, Hughes, & Martin, 1982). More recently the Revised CATPA Inventory (Schutz, Smoll, Carre, & Mosher, 1985) has been used to assess students' attitudes and determine if there are differences in the attitudes of those students taught by a specialist physical education teacher and those students taught by a generalist teacher (Patterson & Faucette, 1990).

The reliability and validity of this instrument has been established and supported. Alpha reliability coefficients (N=1038 Grade 7 male and females) ranged from .76 (Health) to .91 (Aesthetic) and test stability coefficients ranged from .80 to .87 across a 6- month test-retest interval among Grade 10 and 11 students (Ostrow, 1990). Past research using this instrument and the strength of its psychometric properties provided strong support for the use of this instrument in this study.

This CATPA inventory (Carre, Mosher, and Schutz, 1980) utilizes a 5-point semantic differential scale with 5 bipolar adjectives to assess the children's attitudes towards a brief description of each sub domain of the attitude construct. For example, one adjective pair that is used to determine information about the child's attitude towards the social growth domain of physical activity is presented as follows:

How do you feel about the idea below ?

PHYSICAL ACTIVITY FOR SOCIAL GROWTH

Taking part in physical activities which
gives you a chance to meet new people

good ---:--- :---:---:---bad

The child places a mark in the space between the adjective pairs that best reflects their attitude towards that statement. A mark is placed in the appropriate space within each of the five adjective pairs. Scoring for each pair ranges from 1 to 5 points with a score of 5 always associated with the most favorable response. Thus, the maximum score for each sub domain is 25 and the student's score out of 25 is then recorded.

Upon completion of this inventory, each student had eight scores out of 25, that is, one score for each of the eight domains. These individual scores were not accumulated or added together to reflect one general score on their overall attitude but instead the scores from each domain were analyzed separately (Schutz, Smoll, Carre, and Mosher, 1985)

3.2.2 Discussion of Physical Activity Inventories

Self-report measures of children's physical activity have varied a great deal in the specificity with which the duration, frequency, intensity and the types of activities are measured. They also vary in terms of the period of time the respondents can report activity, the time it takes to complete the inventory and the method or units with which the activity is reported. Common methods or units have been calories expended, time involved and rating scales (Baranowski, 1988). Each of the different methods or instruments have their strengths and weaknesses depending on the purpose of the inventory. In conducting research to assess children's physical activity levels it is important to use an inventory that is valid and reliable and allows for specific, accurate information but also one that is simple to administer (Sallis, 1991). Since 297 subjects were assessed in this study, the simplicity of the instrument and the time required to respond were two important factors considered in selecting the data collection instruments.

To reduce any potential concerns about the weaknesses in any one specific instrument this study employed two physical activity inventories. They are both very simple to administer and respond to and they both provide total activity scores as well as specific, additional information that is very useful. The following two sections will discuss each of these inventories.

3.2.3 Physical Activity Questionnaire for Children (PAQ-C)

The student's participation in physical activity was assessed using the Physical Activity Questionnaire for Children (PAQ-Q) that was designed for children 9-14 years old (McGrath & Bailey, 1990) (Appendix H). The questionnaire included an activity checklist and questions directed towards the participation rates for specific segments of the day and the weekend. Children were also asked to indicate, using the five options listed, how often they participated in a variety of physical activities over the past seven days and what they did "most of the time" during various time periods on the weekdays (recess, lunch, after school and evenings) and weekends. All questions are scored on a five-point quasi-interval scale with the most positive response receiving a score of 5 and the least positive response receiving a score of 1. The scores on each of the individual questions and sections (see below) were combined to form one general composite score -ACTTOT.

The Time in Activities Score (TAS) is formed by adding and averaging all of the individual scores received on the first question which requested information about the number of times the subject had participated in the various (N=24) physical activities (swimming, baseball, football etc.) in the past seven days. A score of 1-5 was assigned to each activity choice depending on the amount of participation in each by the subject. A score of 1 indicated "no involvement" for that activity and a score of 2 indicated that they had participated in that activity "1-2 times" in the past seven days. The greatest possible score of 5 indicates that the individual participated in that activity " 7 times or more". The scores generated for each activity were added and then averaged to present the final TAS score. In addition to providing general, descriptive information about the subjects' levels of physical activity this inventory also provides some information about the diversity of and types of activities they participate in (i.e. team versus individual sports; invasive versus non-invasive sports).

Daily Participation Total (Q12TOT) is formed by adding and averaging the scores on each of the questions that determines information about the amount the subject participated in physical activity on each day of the week. A score of 1-5 was assigned to each day of the week depending on how much the subject had participated in physical activity on that day. Descriptive words such as "none", "a little bit", "medium", "often" and "very often" are used to describe their involvement in physical activity for each day of the last seven days. The most positive response, "very often", earned a score of 5 and the least positive response, "none", earned a score of 1. These scores were added and averaged to present the final Q12TOT.

To inquire about the activity behaviour during various time periods of the day and week (before school, recess, lunch, after school and weekends) questions such as the following were asked. "In the last 7 days, on how many days Right After School did you do sports, dance or play games in which you were very active ?" The response options were "none" (a score of 1), "1 time last week", "2-3 times last week", ..., "6-7 times last week" (a score of 5).

The Total Activity Score (ACTTOT) is formed by adding all of the scores on questions (#2-#8) inquiring about the activity behavior at the various time periods (recess, lunch, after school, evenings and weekends) and combining this with TAS and Q12TOT. ACTTOT can be divided by 9 (the number of questions included in the ACTTOT score) to obtain a composite variable ACT generating a continuous score from 1-5. ACT is then grouped to form a 5 point categorical scale ACTCAT:

- scores less than 1.5 are categorized as 1 (very inactive)
- scores from 1.51-2.5 are categorized as 2 (inactive)
- scores from 2.51-3.5 are categorized as 3
- scores from 3.51-4.5 are categorized as 4 (active)
- scores from 4.51-5.0 are categorized as 5 (very active)

The purpose of this ACTCAT score is to enable the researcher to assess the levels of physical activity of each of the subjects and make some very general statements about their physical activity levels. However, for the purpose of this study and its need to make quantitative comparisons, only the ACTTOT score was used as the final activity score.

The Total Activity Score (ACTTOT) was correlated with the individual test question scores that comprised ACTTOT and the correlation coefficients ranged from $r=.37$ to $r=.78$ which suggests that it is a reasonable representation of the children's activity levels.

One potential problem with this inventory is that it is possible that one subject may generally be a very active person but due to extenuating circumstance the subject may have been very inactive in the last seven days before the recall testing session therefore the scores would not represent the subjects true activity level. To address this potential problem this inventory allows the respondent to indicate if sickness or injury had prohibited that individual from being active and if this was the case the subject was omitted from the analysis of the data on the activity levels .

This inventory has been tested for test-retest reliability. Using intra-class correlation with the continuous variable ACT the reliability coefficient was $r=.75$ and $SEM=3.3$ and has therefore, provided initial, but rather weak, support for the use of this questionnaire to assess physical activity levels and patterns of children. Unfortunately, this inventory has yet to be validated with another measure such as caloric expenditure, teacher observation, body fat or VO_2 max and therefore its use as an inventory is somewhat limited. Moreover, often the use of descriptive words such as "often" or "very little" to report physical activity levels may not be very accurate. What might be perceived as "very little" activity to one individual may be very different to another and therefore, one might question its accuracy in reporting physical activity.

These weaknesses in this inventory served as the basis for deciding to use an additional validated physical activity inventory to assess the student's physical activity levels.

3.2.4 Leisure Time Exercise Inventory (LTEI)

The physical activity levels of the students were also measured using the Leisure Time Exercise Inventory (Godin & Shephard, 1984) wherein a general weekly activity score is calculated by summing three indices representative of the participation in activities at three different intensity levels (Appendix I). The subjects were to report how many times they were active for more than 15 minutes at one time in activities of strenuous, moderate and mild intensity. Descriptions of activities that are strenuous, moderate and mild are provided to help the subjects report accurate results. For example, vigorous running or cycling would represent strenuous activities, brisk walking or tennis would represent moderate activities and, casual walking and bowling would represent mild activities. These weekly frequencies are then multiplied by the corresponding anticipated multiples of resting energy expenditure (nine, five and three METs). The three product (frequency * MET) indices provides information on the perceived frequency of strenuous physical activity and its relationship to the reported frequency presented in the first section of the inventory.

This instrument has been used in several studies in the past and has the advantage of requiring very little administration time and administrator burden (Sallis et al., 1991). Godin and Shephard (1984) performed a preliminary analysis on this inventory using 690 subjects (males=356, females=364) in a study examining children's attitudes towards exercise. The two-week test-retest reliability coefficient for this instrument was .84. Direct validity was supported in that scores reported by adolescent swimming competitors differed significantly from that reported by average children of the same age.

Godin and Shephard's later study (1985) also provides strong support for the use of this inventory as they also report encouraging reliability and concurrent validity measures in a study using self-selected healthy adults of both sexes. Pearson correlation coefficients between the subject's reported leisure time activity and objective measures of physical condition (percent body fat and VO₂ max percentile) were calculated and were reported at 0.21 and 0.38 respectively. They claim that this data provides initial support for predictive concurrent validity. Two week test-retest reliability coefficients were respectively 0.94, 0.46 and 0.48 for self reports of strenuous, moderate, and light exercise using the Leisure Time Exercise Inventory (Godin & Shephard, 1984).

Sallis et al. (1991) used this inventory to measure the activity levels of Grade 5-11 students with equal number of males and females. They reported 2-week test-retest reliability coefficients of .85 to .96 depending on the age of the subjects.

3.2.5 Participant Seven Day Exercise Recall Inventory

To improve the reliability of their responses and to help the students recall the frequency of their participation in physical activity a chart that segmented the times of the day and the seven days of the week was developed by the researcher for this study. It allows the subjects to recall each day of a typical week and mark off any time periods within each day (morning, recess, lunch hour, after school, after dinner) that they were active for more than fifteen minutes in activities of any intensity (mild, moderate and strenuous). The subjects did not have to complete this chart unless they needed help in recalling a typical week of activity and reporting their frequency (Appendix J).

3.2.6 Teacher Questionnaire

It has been reported that teachers can have a significant effect on how children perceive physical education and physical activity (Figley, 1985; Patterson & Faucette, 1990). Methods used by a teacher in both the administrative and instructional aspects of the physical education class may "turn on" a child to physical activity. They will then perceive physical activity and physical education as an enjoyable, rewarding experience. In some cases however, the instructional techniques and methods that a teacher employs may severely damage a student's perception of physical activity and physical education. For this reason it was very important to access background information on the teachers as well as information about their class content that might help to explain any attitude or activity (or relationships between them) differences that might be discovered in analyzing and comparing classes.

Information on the teacher's educational background, years of teaching experience, use of curriculum and instructional resources, teaching situation at the school, and initiatives in teacher training or professional development was sought in this questionnaire to help to explain any possible differences between class means (Appendix K). However this minimal data on teachers was not subject to any statistical scrutiny because of the limited number of teachers responding and the lack of quantitative information received.

3.3 Data Collection Procedures

The data was collected by the researcher on each occasion at a meeting time pre-arranged with the cooperating teacher of each school. All of the schools were surveyed in a period of six school days. Throughout the total eight day testing period in May the data was collected under the same conditions and occurred in the morning session which ensured standardization of conditions.

The students that met the subject requirements were asked to clear their desks and pay very careful attention to the directions for procedure. Those students unable to participate because they did not meet subject requirements were given the questionnaires but were omitted from the analysis. Those students that neglected to return their parental consent forms or were not given parental consent were asked by the teacher to read quietly. Following a brief introduction and an orientation to the research study a brief instruction sheet was read aloud to all subjects. (Appendix F). The importance of confidentiality, accuracy and honesty was stressed once again. Students identified themselves only by a code name that was intended to indicate the school number (1-10) and the program type (Non-daily=1, Daily=2). They also indicated their present age, date of birth and gender.

After a brief example was provided and concerns raised by the students were addressed the students responded to the Leisure Time Exercise Inventory (Appendix G) . It was pointed out that if on four days of the week an individual went running for one hour each time, and if this was the only strenuous activity for that week, a frequency of 4 for activities of the strenuous type must be written down. It was also pointed out to the students that any activity pursued for more than 15 minutes at any one time whether it was 20 minutes or 90 minutes was to count only as only once in terms of frequency. If they interrupted that activity by 30 minutes or more and then engaged in that activity once again for more than 15 minutes then this counted as another activity time. Again, if the students had problems recalling their activity patterns they were told to make reference to the Participant Seven Day Exercise Recall Inventory.

While the students were completing the inventory they were able to ask questions privately to the test administrator. In all cases there were queries of some nature which usually revolved around whether some specific activities and sports

should be classified into strenuous, moderate or mild activities. A standard response was provided by the test administrator for all activities questioned.

Once the first inventory was completed by all of the subjects the directions for the CATPA inventory (Appendix G) were provided. A brief introduction and set of directions are provided at the beginning of the CATPA inventory which were read aloud. An brief example was then given to the students. They were told to think about "REFEREES" and then use the five adjective pairs to help describe how they feel about them. A visual representation of a sample page drawn on the chalkboard by the researcher was used to help explain the procedure. If there were no other questions the students immediately began.

The final PAQ-C inventory was completed after the subjects had completed the CATPA inventory. The directions for the PAQ-C (Appendix H) are very clear so the subjects were asked to read each question carefully to themselves prior to responding. At this point the students were reminded that their answers should be honest, accurate and confidential. In the PAQ-C there is a question regarding activity time during the physical education class but because only the activity levels outside of the regular instructional class time were being sought the students were asked to omit this question.

Once the subjects had completed the final inventory they were asked to turn their booklets over and wait quietly until everyone was finished. The booklets were then collected by the researcher and the class was thanked. This process took approximately 20-35 minutes depending on the cooperation of the class.

3.4 Organization of Data

Once all of the data was collected from each of the ten schools the data from the questionnaires and inventories had to be collated to represent scores for each of

the variables outlined. The data also had to be organized to allow for effective analysis.

All of the students in the daily physical education programs were assigned a nominal code of 1 and those students in the non-daily physical education program were assigned a nominal code of 2. "Program" therefore became the first categorical variable with values of 1 or 2. All of the males of the population (N=15) were assigned a nominal code of 1 and all of the females of the sample (N=139) were assigned a nominal code of 2. "Gender" became the second categorical variable with values 1 or 2. Students were also coded by school and represented the third categorical variable "School" with values 1-10.

3.4.1 List of Variables (Abbreviations and Descriptions)

Collating data for each of the inventories and questionnaires produced a number of variables related to each of the attitude and physical activity measures. This study employed three different data collection instruments so there were also three groups of variables relating to each of the attitude and physical activity measures. The following is a list of all these variables, their abbreviations and brief descriptions of each.

A. Children's Attitude Towards Physical Activity (CATPA)

ASCETIC - attitude dimension representing physical activity as an ascetic experience (long and hard training)

CATHART - attitude dimension representing physical activity as a cathartic (stress reduction) experience

HF ENJOY - attitude dimension representing physical activity as an enjoyable health and fitness experience

HF VAL - attitude dimension representing physical activity as a valuable health and fitness experience

RELATIONS - attitude dimension representing physical activity as a chance to be with your friends (representing Social Continuation)

GROWTH - attitude dimension representing physical activity as a chance to meet new people (representing Social Growth)

VERTIGO - attitude dimension representing physical activity as a thrill but involving some risk

AESTHET - attitude dimension representing physical activity as graceful and beautiful movements

All of the scores on these attitude variables have a minimum score of 5 and maximum score of 25.

B. Physical Activity Questionnaire for Children (PAQ-C)

TAS - representing an average of involvement in a variety of sports in the last seven days (min = 1 , max = 5)

Q12TOT - representing an average of activity level (in any sports or activities on the last seven days (min = 1 ,max = 5)

ACTTOT- total activity score (representative of the last seven days) consisting of TAS and Q12TOT as well as 5 other questions with a maximum score of 5 (min = 7 , max = 35)

C. Leisure Time Exercise Inventory (LTEI)

MILD - Frequency of participation (more than 15 minutes) in activities of mild intensity.

MOD - Frequency of participation (more than 15 minutes) in activities of moderate intensity.

STREN - Frequency of participation (more than 15 minutes) in activities of strenuous intensity.

TOTAL - a total activity score calculated using the above data $TOTAL = (MILD * 3) + (Mod * 5) + (STREN * 9)$. This score is representative of a typical seven day period

3.5 Data Analysis

The data related to each of the variables identified above was statistically analyzed to separately test each of the three hypotheses. All statistical procedures were implemented using the SYSTAT 5.1 statistical program.

SYSTAT procedures to calculate and present descriptive data for each of the fifteen variables were conducted and the results are presented in Chapter 4. The following is a list of statistical procedures employed to test each of the three hypotheses.

3.5.1 Hypothesis #1 (Students involved in the daily physical education programs will exhibit more positive attitudes towards physical activity than the students involved in the non-daily physical education programs)

To determine whether or not there were any Program and Gender differences in expressed attitudes a multivariate analysis of variance using Hotelling T^2 was conducted with the data. The interaction effect was also analyzed using multivariate analysis of variance.

The univariate analysis of variance of each of the contributing dependent variables was also followed up in the analysis given that there were any significant multivariate F ratios.

3.5.2 Hypothesis #2 (Students involved in a program of daily physical education will participate in physical activities more than the students involved in the non-daily physical education programs)

To determine if there were any Program or Gender differences in activity levels a multivariate analysis of variance using TOTAL and ACTTOT with Program ,Gender and the Program X Gender interaction effects were performed.

As MILD, MOD and STREN are composite of the TOTAL score they were analyzed separately from the preceding multivariate analysis of variance. Univariate analyses are also examined to determine which of those three variables contributes to the differences.

3.5.3 Hypothesis #3 (A significant relationship between attitudes towards physical activity and levels of participation in physical activity will be demonstrated using the attitude and activity data of the students)

To examine the relationship between attitudes towards physical activity and participation levels a multiple regression analysis was applied using activity measures as the dependent variables and each of the attitude dimension scores as the independent variables. Such an analysis would indicate which attitude dimensions best predict participation in physical activity. Separate analyses were performed using both TOTAL and ACTTOT.

To further examine this relationship, separate analyses were performed (using TOTAL and ACTTOT) for males and females and for subjects in Program 1 and subjects in Program 2.

3.5.4 Relationship Between the Activity Measures (ACTTOT and TOTAL)

To determine the statistical relationship between the two activity measures produced by the two separate inventories as well as their composite scores simple correlational statistics were applied to the data to derive correlation coefficients.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Overview of the Results

4.1.1 Descriptive Statistics

Descriptive statistics for each of the behavioural measures were obtained before conducting specific statistical analyses. For the purposes of this study the descriptive statistics include all behavioural measures for the two different program groups (Daily and Non-Daily), genders (males and females) and the combination (interaction) of program and gender.

Table 4.1.1 Descriptive statistics for Program and Gender measures (means {M} and standard deviations {SD})

MEASURE	PROGRAM				GENDER			
	Daily (1) (N=154)		Daily (2) (N=143)		Male (1) (N=158)		Female (2) (N=139)	
	M	SD	M	SD	M	SD	M	SD
LTEI (times/wk)								
MILD	7.16	5.84	6.37	4.2	7.17	5.80	6.33	4.18
MODERATE	6.99	4.82	4.94	3.05	6.54	4.83	5.47	3.39
STRENUOUS	7.33	4.87	5.28	3.31	7.83	4.68	4.66	3.09
TOTAL (scaled)	121.93	65.39	92.04	45.58	124.44	64.88	88.32	43.27
PAQ-C								
TAS (scaled)	1.78	0.55	1.69	0.48	1.79	0.54	1.66	0.47
Q12TOT(scaled)	3.54	0.86	3.17	0.93	3.59	0.87	3.10	0.89
ACTTOT	22.76	4.69	20.47	4.93	23.27	4.54	19.83	4.72
CATPA (/25)								
ASCETIC	16.28	5.77	15.79	5.05	16.63	5.69	15.43	5.08
CATHARTIC	19.63	5.19	20.18	4.59	19.87	4.60	20.03	5.25
HF ENJOY	21.11	3.66	20.39	4.30	20.54	4.15	20.97	3.81
HF VALUE	22.47	3.67	22.99	3.56	22.72	3.75	22.75	3.49
RELATIONS	22.27	3.90	22.13	3.75	21.85	3.96	22.54	3.64
GROWTH	19.81	3.81	19.63	3.38	19.74	3.49	19.73	3.73
VERTIGO	17.34	5.73	17.08	4.95	18.44	5.02	15.98	5.44
AESTHETIC	16.47	5.77	15.92	5.70	14.58	5.86	17.92	5.19

Table 4.1.2 Descriptive statistics for Program by Gender interactions
(means {M} and standard deviations {SD})

MEASURE	PROGRAM 1 (N=154) (Daily)				PROGRAM 2 (N=143) (Non-Daily)			
	Male (N=86)		Female (N=68)		Male (N=72)		Female (N=71)	
	M	SD	M	SD	M	SD	M	SD
LTEI (times/wk)								
MILD	7.54	6.63	6.76	4.64	6.74	4.65	6.00	3.69
MODERATE	7.57	5.55	6.25	3.62	5.17	3.09	4.72	2.99
STRENUOUS	8.92	5.39	5.32	3.14	6.53	3.22	4.01	2.92
TOTAL (scaled)	139.31	73.91	99.94	44.23	106.60	46.68	77.18	39.51
PAQ-C								
TAS (scaled)	1.82	0.58	1.72	0.49	1.78	0.49	1.60	0.45
Q12TOT(scaled)	3.70	0.85	3.33	0.82	3.45	0.87	2.88	0.91
ACTTOT	24.19	4.29	20.94	4.56	22.16	4.62	18.77	4.66
CATPA (/25)								
ASCETIC	17.02	5.76	15.54	5.73	16.25	5.62	15.32	4.39
CATHARTIC	20.48	4.24	18.78	6.09	19.14	4.90	21.23	3.98
HF ENJOY	21.45	3.49	20.76	3.84	19.64	4.66	21.16	3.79
HF VALUE	22.97	3.62	21.97	3.69	22.47	3.90	23.52	3.12
RELATIONS	21.83	4.08	22.71	3.63	21.88	3.84	22.38	3.67
GROWTH	20.08	3.76	19.53	3.86	19.33	3.12	19.93	3.62
VERTIGO	19.06	5.10	15.62	5.94	17.82	4.87	16.32	4.94
AESTHETIC	15.34	5.75	17.60	5.85	13.64	5.90	18.23	4.49

Refer to Sections 3.2.1-3.2.4 for descriptions of each of the scores in the inventories and an explanation of their meaning and interpretation.

4.1.2 Teacher Questionnaire Results

Due to union policies in effect during the data collection period only 4 of the ten teachers were willing to fill out the questionnaires. The minimal data was not collated and therefore eliminated the possibility of identifying any correlations between the teacher data and the student measures.

4.2 Attitudes Towards Physical Activity : Data Analysis of Hypothesis #1

It was hypothesized that the students involved in a program of daily physical education would exhibit more positive attitudes towards physical activity when compared to students involved in a non-daily physical education program. Given that attitude towards physical activity is a multidimensional construct consisting of eight different domains it was also necessary to determine which attitude domains would best discriminate between the two program groups.

The mean scores of the attitude domains for each Program and Gender group are presented in Table 4.1.1. Under the CATPA category each score represents the students' measure of their attitudes towards the eight specific domains of physical activity. The maximum possible score is 25. In comparing these averages to the normative data presented in the results of a study assessing 1050 Grade 7 students (Carre, Mosher, & Schutz, 1980) it is clear that the subject's scores in this present study are substantially lower in most of the domains. The only exceptions are the Social Continuation domain (Relations) for both genders and the Vertigo domain for the males where the mean scores from this study were generally the same as the 1980 normative data. There is no literature available that would suggest why the students' attitudes are less positive in this decade. One can only speculate that with the advent of technology and other sedentary leisure pursuits children no longer value and appreciate physical activity to the same degree as those children from ten years ago. This may occur despite the numerous government and school based initiatives designed to promote a positive attitude towards physical activity.

In comparing this data to that reported in the Patterson and Faucette (1990) data where the subjects were in Grades 4 and 5 it is apparent that the attitudes towards physical activity of the subjects in this study are more positive than those of the subjects in the 1990 study. The Vertigo, Ascetic, and Cathartic domains are significantly greater whereas the Health & Fitness: Value, Health & Fitness: Enjoyment

are generally the same. It is possible that the differences in the ages can account for the inequalities in the attitude scores. For example, it is possible that children in grades 4, 5 and 6 do not appreciate the cathartic or ascetic value of physical activity because they have little experience in activities that develop that awareness. Smoll and Schutz (1980) revealed however that there was a group (not within individuals) instability of attitudes across grade and therefore comparisons to the data are not justifiable and differences do not necessarily have to be explained.

This study utilized the latest CATPA inventory that incorporated the most recent psychometric recommendations suggested by Schutz, Smoll and Wood (1981b) and presented by Schutz, Smoll, Carre, and Mosher (1985). Prior to 1985, the inventory underwent extensive adaptations to the scoring procedures and sub domains identified and therefore comparisons to mean attitude scores in earlier studies (pre 1985) would not be acceptable. The data is however, consistent with the results of the Schutz, Smoll, Carre, and Mosher (1985) study and others (Carre, Mosher, & Schutz, 1980; Patterson & Faucette, 1990; Schutz, Smoll, & Wood, 1981b; Simon and Smoll, 1974; Smoll, Schutz, & Keeney, 1976; Williams, Hughes, & Martin, 1982) in that the rank order of sub domains is almost identical. In all studies the order of the three most positive domains were found to be 1) Health and Fitness (Value), 2) Social Continuation and 3) Health and Fitness (Enjoyment)

The results of the multivariate analysis of variance and univariate follow up analyses are presented in Table 4.2.1. Examination of the data showed a non significant multivariate F-ratio for Program effects and the 2-way (Program X Gender) interaction. In other words, there were not any significant differences in the attitudes between the daily and non- daily physical education program groups. Also, the differences between the male and female attitudes towards physical activity were generally similar for each of the two Program groups. Williams, Hughes and Martin (1982) also reported a non significant interaction in their study of the effects of a ten

week physical education program on students attitudes towards physical activity. However, a significant multivariate F-ratio was exhibited for the gender effect, $F(8, 286) = 6.83, p < .001$. This result indicates that when all of the domains are taken into statistical consideration there is a significant difference between the male and female attitudes towards physical activity (see Table 4.2.1.)

Table 4.2.1 Results of MANOVA and univariate follow-ups for ATPA

Multivariate Results

Effects	F(8,286)	p
Program	1.11	< 0.369
Gender	* 6.831	< 0.001
Program x Gender	3.078	< 0.202

* significant

Univariate ANOVA Follow ups

Variable	Program		Gender	
	F(1,293)	p	F(1,293)	p
Aesthetic	0.69	< 0.41	* 28.18	< 0.01
Ascetic	0.62	< 0.43	3.63	< 0.06
Cathartic	0.97	< 0.33	0.12	< 0.72
HF Enjoy	2.37	< 0.13	0.82	< 0.37
HF Value	1.56	< 0.21	0.01	< 0.74
Relations	0.10	< 0.75	2.40	< 0.12
Growth	0.17	< 0.68	0.03	< 0.96
Vertigo	0.19	< 0.66	*14.50	< 0.01

*significant

4.2.1 Program Comparison

A non significant multivariate F-ratio was obtained for the Program effect, $F(8,286) = 1.11, p < .369$ (see Table 4.2.1). In other words, the attitudes towards physical activity of the students involved in the daily physical education program did not significantly differ from the attitudes of the students involved in the non-daily physical education program. The results are consistent with those of the Williams, Hughes, and Martin (1982) study. Using a different scoring procedure (all of the CATPA domains were added to form one composite ATPA score) with the original CATPA inventory (Simon & Smoll, 1974) they compared pre- and post-test scores of the control group and the experimental group receiving ten weeks of daily physical education and reported non-significant differences. Unfortunately there is no other data in the literature that can be compared to the results of this study.

There are a number of possible reasons for the non significant difference reported in this study. Research on attitude and attitude development specifically contends that there are a number of determinants of one's attitude. The content within the program, the influence of the parental attitudes, personal experiences with the other students and the teachers within the program, and the quality of physical activity experiences outside of the instructional program in school can have a direct impact on the student's attitudes towards physical activity. Therefore, any difference that the frequency and time allotted to physical education is making is either not substantial enough to show a statistical difference or the effect of all the other determinants is simply much stronger compared to the program effect.

One of the requirements for the sample population was that the subjects had to have been involved in the program for at least two years. It is possible that the positive effects of the daily physical education program were not realized in this two year period. Perhaps it takes much longer for one's involvement in a specific program to shape or change one's attitude towards physical activity.

It is also possible that the CATPA inventory was not sensitive enough to discriminate between the two groups when all attitude domains were considered. Schutz, Smoll, and Wood (1981a) discussed the possibility of a ceiling effect that would limit children's measured attitudes and would therefore present difficulties in identifying any differences between individuals and possibly groups. It has been reported that if attitudes are already high then the effect of any variable would be minimal and therefore difficult to detect (Williams, Hughes, and Martin 1982) and this may help explain the lack of significant differences between the two programs. One potential problem in suggesting this as an explanation is that the attitude expressed by the subjects in this study are generally low compared to the norms presented in the B.C. Physical Education Assessment Project (Carre, Mosher, & Schutz, 1980). Therefore, the ceiling effect implied by Williams, Hughes and Martin (1982) and Schutz, Smoll, and Wood (1981a) would not necessarily be in effect in this study.

Nonetheless, it is clear that there is no clear evidence to support the common contention that daily physical education has a positive effect on student's attitudes towards physical activity.

4.2.2 Gender Comparison

The results in Table 4.2.1 show that there is a significant multivariate F-ratio , $F(8,286) = 6.83$, $p < .001$ for the gender main effect. This result is consistent with the available literature that has used CATPA to determine gender differences in attitude towards physical activity (Carre, Mosher, & Schutz, 1980; Simon & Smoll; Smoll & Schutz, 1980; Schutz & Smoll, 1984; Williams, Hughes, & Martin., 1982). In Smoll and Schutz's (1980) longitudinal study the results report a significant difference between genders revealing a 2×2 multivariate F-ratio, $F(6,105) = 15.77$, $p < .001$ (averaged over the grades). Williams et al. (1982) also reported significant gender differences using a simple analysis of variance with a total attitude score, $F(1,245) =$

4.42, $p < .013$. Despite these differences being considerably weaker this study illustrates the consistency with the findings of other research.

In comparing male and female attitudes towards physical activity it is also important to determine which of the attitude domains best explain the gender differences. In the interpretation of the univariate follow-ups it is apparent that the aesthetic and vertigo domains best differentiate the attitudes towards physical activity of males and females showing univariate F-ratios $F(1,293) = 28.18$, $p < .001$ and $F(1, 293) = 14.50$, $p < .001$ respectively. The males exhibited more positive attitudes towards physical activity as a pursuit of vertigo (mean = 18.44 for males compared to mean = 15.98 for females) (see Table 4.1.1) whereas the girls exhibited more positive attitudes towards the aesthetic domain (mean = 17.92 for females compared to mean = 14.58 for males). This is consistent with the Smoll and Schutz (1980) results that report significant univariate F-ratios for the vertigo ($p < .01$) and aesthetic ($p < .01$) domains (they also found differences in the catharsis domain). Females hold more positive attitudes towards participating in physical activities with an aesthetically pleasing nature than males. Males on the other hand hold more positive attitudes towards the "thrill" activities when compared to females. In explaining the differences it may be due to the social desirability or social normative behavior that leads males and females to respond accordingly.

Similarly, in the examination of the rank order of the sub domains the differences between males and females reported in this study are consistent with those of earlier studies. In examining the descriptive data supplied in Table 4.1.1 it is shown that the males and females ranked the first five domains similarly in the following order: Health and Fitness: Value, Social Continuation, Health and Fitness: Enjoyment, Catharsis and Social Growth. The males least favorable attitude was expressed in the aesthetic domain which is consistent with the other literature (Carre, Mosher, & Schutz, 1980; Schutz & Smoll, 1984; Smoll & Schutz, 1980; Smoll &

Simon, 1974) The females exhibited the least favorable attitude towards the Ascetic dimension which is consistent with the Smoll and Schutz (1980) study but only slightly similar to the Carre et al. (1980) data that reports the Vertigo domain as the domain which the subjects held the least favorable attitude towards and the ascetic domain as the seventh highest.

4.3 Participation in Physical Activity: Data Analysis of Hypothesis #2

The primary objective of the statistical analysis related to Hypothesis 2 was to determine whether or not the students involved in a program of daily physical education participated in physical activities more than their peers involved in a non-daily physical education program.

Table 4.3.1 presents the results of the multivariate and univariate analyses conducted for Program and Gender differences using both of the physical activity inventories and their composite scores, TOTAL (Leisure Time Exercise Inventory), and ACTTOT (Physical Activity Questionnaire for Children). Table 4.3.2 presents multivariate and univariate analysis results using the three composite scores of the Leisure Time Exercise Inventory "TOTAL" score. This score provides more descriptive information about the Program and Gender differences in terms of the frequency of participation in activities at different intensity levels

Table 4.3.1 Results of MANOVA and Univariate follow-ups using TOTAL and ACTTOT

Multivariate Results

	F(2, 292)	p
Program	* 11.37	< 0.001
Gender	* 22.654	< 0.001
Program x Gender	0.532	< 0.588

*signifigant

Univariate follow-ups

Variable	Program		Gender	
	F(1,293)	p	F(1,293)	p
TOTAL (LTEI)	* 19.262	< 0.001	* 29.777	< 0.001
ACTTOT (PAQ-C))	* 15.968	< 0.001	* 39.862	< 0.001

* significant

Using the TOTAL activity score presented in Table 4.1.1 under the LTEI category, the results suggest that the students are generally more active than the students in other research studies. Godin and Shephard (1984) assessed 698 male and female Grade 7 students and the overall mean activity score for all subjects was 81.8 +/- 36.2 for males and 61.7 +/- 23.8. for females. This is considerably less than the mean score of 124.44 +/- 64.88 for male students and a mean score of 88.32 +/- 43.27 for the female students that were assessed in this study. Of notable interest are the differences in standard deviations between the sample populations of both studies. The greater standard deviations in the present sample suggests that there are great variations in the activity levels and it is possible that a select group of subjects are skewing the results in favour of the present sample population. In comparing the data from this research study to Godin and Shephard's (1984) data it is interesting to try to explain the differences in activity levels of the subjects. In recent years research emphasis and media coverage (consistent with the Canadian government's Active Living campaign) have placed more value on and encouraged mild exercise routines such as gardening and walking and therefore children may be recognizing the

importance of such activities and becoming more active in those types of mild physical activities (Sallis, 1991).

Unfortunately additional comparisons are not feasible as there are no other studies that used the same instrument with the same age of children.

Table 4.3.2 Results of MANOVA and univariate follow-ups using TOTAL (LTEI)

Multivariate Results

Effects	F(3, 291)	p
Program	* 8.144	< 0.001
Gender	* 15.820	< 0.001
Program * Gender	0.647	< 0.506

Univariate ANOVA follow-ups

Variable	Program		Gender	
	F(1,293)	p	F(1,293)	p
Mild	1.399	< 0.24	1.66	< 0.199
Moderate	* 17.39	< 0.001	* 3.51	< 0.001
Strenuous	* 16.54	< 0.001	* 45.08	< 0.001

* significant

4.3.1 Program Comparison

A multivariate analysis of variance (MANOVA) was conducted to determine the program and gender effects considering both of the inventory scores (see Table 4.3.1). The Program main effect was highly significant $F(1,293) = 19.262$, $p < .001$ using the Total score from the Leisure Time Exercise Inventory . Using the ACTTOT

score from the Physical Activity Questionnaire for Children a highly significant F ratio for the Program main effect was also present, $F(1, 293) = 15.968$, $p < .001$. Considering both of the inventories in the analysis the Program main effect was also highly significant showing a multivariate F ratio $(2, 292) = 11.37$, $p < .001$. The results suggest that the students involved in the daily physical education programs participated more in physical activity than their peers in the non-daily programs. Examination of the descriptive data (see Table 4.1.1 and 4.1.2) helps illustrate this difference. Using the LTE Inventory the individuals in the daily physical education programs reported a mean TOTAL score of 121.93 ± 65.39 while the subjects in the non-daily physical education programs reported a mean TOTAL score of 92.04 ± 45.58 . Using the PAQ-C the subjects in the daily physical education programs reported a mean ACTTOT score of 22.76 ± 4.69 while the subjects in the non-daily physical education programs reported a mean ACTTOT score of 20.47 ± 4.93 . In interpreting these results there is little research available that can be used for comparison. Also, it is very difficult to explain the differences in participation levels between the two groups. If the attitudes were also significantly different and a significant attitude-behaviour relationship had been presented the results would have been simply explained. One could then deduce that if daily physical education students had more positive attitudes which were strongly related to their levels of participation then it would follow that they would exhibit greater levels of participation. These results were not discovered and since there is no theory to help explain the differences then one can only speculate. Bain (1980) may have helped to explain this by suggesting that students become "socialized" into the role of active participants by developing regular physical activity behaviors in a program of daily physical education. It is also possible that students reap the benefits of regular physical activity more frequently so in addition to the activity becoming habitual they make an effort to

become active because they have realized and experienced the benefits to a greater degree.

Perhaps, there is also a significant difference in the recess, lunch and after school programs available to the students. Due to the labor dispute at the time of data collection the teachers in both programs were not providing the usual inter school or intramural sport programs. It is possible that the students in both the school programs were enjoying alternative physical activity experiences. It would seem however that this option itself could not account for such significant differences.

The Leisure Time Exercise Inventory (Godin and Shephard, 1984) provides various specific information about the individual's physical activity patterns and therefore, the TOTAL score consists of other scores related to their activity levels. The TOTAL activity score is a composite of a calculated interaction of three scores- Mild, Moderate, and Strenuous and therefore is subject to multivariate analyses as well as univariate analyses. Table 4.3.2 presents the results of a multivariate analysis using all of the composite scores to assess the main effects as well as the univariate analyses to determine which of the composite scores best discriminate between the Program groups. The results of the multivariate and univariate analyses presented in Table 4.3.2. indicate that for the Program effect only the Moderate, $F(1,293) = 17.39$, $p < .001$ and Strenuous, $F(1,293) = 16.54$, $p < .001$, activity scores show significant univariate F-ratios. In other words, only the moderate and strenuous levels of physical activity are able to discriminate between the daily physical education and non-daily physical education groups. This suggests that the these two program groups exhibited significant differences in moderate and intense activities. In the examination of the mean scores presented in Table 4.1.1 it is clear that there is an insignificant difference in the amounts that each of Program groups participate in mild activities.

4.3.2 Gender Comparison

The Gender main effect was highly significant using both of the inventories scores in the statistical analysis, $F(2,292) = 22.654$, $p < .001$ (see Table 4.3.1). Using only the TOTAL score of the Leisure Time Exercise Inventory the univariate analysis showed an F ratio $(1,293) = 29.777$, $p < .001$. Using the ACTTOT score from the PAQ-C the univariate analysis showed an F ratio $(1,292) = 39.862$, $p < .001$. Using either of the inventories separately or in considering both of them together in the statistical analysis it is clear that the males in this study are more active than the females.

Examination of the univariate follow-ups allow for a more detailed description of the differences (see Table 4.3.2). Although both of the univariate F ratios for the moderate and strenuous activities are significant, $F(1,293) = 3.51$, $p < .001$ and $F(1,293) = 45.08$, $p < .001$ respectively, it is clear that the amount of participation in strenuous activities best discriminates between males and females.

Past research has also reported that males are more physically active than females. (Godin & Shephard, 1984; Sallis et al., 1993). The descriptive data reported in Godin and Shephard (1984) is also very similar to the descriptive data for this study presented in Table 4.1.1. In both studies, the males are most active in the strenuous activities while the females are more active in the mild exercises. The only difference in the data presented in this study when compared to Godin and Shephard's (1984) is that the second most frequent type of activities for the present study's male subjects are the mild activities while the subjects from the earlier study participate in these mild activities the least.

There are many explanations for this significant difference in activity levels and the intensity of activities including the lack of social desirability for females to be active that is still deeply entrenched in our value system. Also, one must also look at the availability of programs, equipment and other resources for females compared to

males. Seemingly, females have to contend with this inequity in order to be equally active.

4.4 Attitude-Participation Relationship: Data Analysis of Hypothesis #3

To test the third hypothesis and determine if a significant relationship between the student's attitudes towards physical activity and their actual levels of physical activity exists a multiple regression analysis was conducted. Each of the eight attitude domain scores were forced entry into the regression equation to examine the individual scores relationship to the physical activity. Table 4.4.1 presents the results of the regression analysis statistics that indicate the relationship between the eight attitude towards physical activity domains and the TOTAL activity score from the Leisure Time Exercise Inventory. Table 4.4.2 presents the regression analysis statistics that indicate the relationship between the 8 domains and the ACTTOT score from the PAQ-C.

Table 4.4.1 Multiple regression analysis for attitude-participation relationship
: TOTAL activity score (Leisure Time Exercise Inventory)

Multiple Regression Analysis						
	All Subjects (N=297)		All Males (N=158)		All Females (N=139)	
Squared Multiple R	0.142		0.161		0.098	
Variable	t value	P (2 Tail)	t value	P (2 Tail)	t value	P (2 Tail)
Aesthetic	-2.502	0.013	0.049	0.961	-2.421	0.017
Ascetic	3.146	0.002	2.365	0.019	2.055	0.042
Cathartic	0.957	0.339	0.858	0.392	0.533	0.595
HF Enjoy	1.458	0.146	1.068	0.287	0.841	0.402
HF Value	-0.865	0.388	-0.646	0.519	-1.460	0.147
Relations	-0.965	0.336	-0.260	0.795	0.172	0.864
Social	2.048	0.041	-1.270	0.206	1.359	0.172
Vertigo	3.050	0.003	2.609	0.010	-0.195	0.846
F(8,288) p	* 5.978	< 0.001	* 3.585	< 0.001	1.760	< 0.091

* significant

Table 4.4.2 Multiple regression analysis for attitude-participation relationship
: ACTTOT activity score (Physical Activity Questionnaire for Children)

Multiple Regression Analysis						
	All Subjects (N=297)		All Males (N=158)		All Females (N=139)	
Squared Multiple R	0.133		0.155		0.089	
Variable	t value	P (2 Tail)	t value	P (2 Tail)	t value	P (2 Tail)
Aesthetic	-2.397	0.017	-1.107	0.270	-0.514	0.608
Ascetic	3.035	0.003	1.027	0.306	2.721	0.007
Cathartic	0.363	0.712	0.558	0.578	-0.026	0.979
HF Enjoy	1.621	0.106	1.888	0.061	0.853	0.395
HF Value	0.303	0.762	0.558	0.578	-0.671	0.504
Relations	-1.859	0.064	-2.305	0.023	0.376	0.708
Social	2.406	0.017	2.042	0.042	0.898	0.371
Vertigo	2.413	0.016	2.132	0.035	-0.545	0.587
F(8,288) p	* 5.500	< 0.001	* 3.421	< 0.001	1.582	< 0.132

* significant

The results of the multiple regression analysis presented in Tables 4.4.1 and 4.4.2 suggest that there is a weak, but significant positive relationship between the male students' attitudes towards physical activity and their levels of participation (involvement) indicated by a significant F value, $F(8,288) = 3.585$, $p < .001$ using the TOTAL score and a significant F value, $F(8,288) = 3.421$, $p < .001$ using the ACTTOT score. Examination of the correlation values ($R^2 = .161$, Table 4.4.1) indicates that approximately 16 percent of the variance in the participation levels (measured using both of the inventories) can be explained by the attitude domains. The strength of this correlation can be attributed to the strong association between ascetic and vertigo domains of attitude towards physical activity, $t = 2.365$, $p < .019$ and $t = 2.609$, $p < .010$ respectively, and participation using the TOTAL score. Using the ACTTOT score the strength of the correlation can be attributed to the strong association between the

social growth and vertigo domains, $t = 2.042$, $p < .042$ and $t = 2.132$, $p < .035$ respectively, and the physical activity levels. It is interesting that different attitude domains accounted for the significant relationship between attitudes and activity levels measured by TOTAL when compared to the relationship revealed using ACTTOT activity measures. A possible explanation may lie in the type of information presented in the TOTAL score. For males the greatest contributor to the TOTAL score was their participation in strenuous activities that may reflect their attitudes towards the ascetic nature of physical activity which represents an appreciation for the long and hard training aspect of some activities. Therefore, one would suspect that the correlation between activity levels, predominantly of a strenuous nature, is greatest with the ascetic domain using the Leisure Time Exercise Inventory and TOTAL score. To determine why the ACTTOT score's relationship with attitude is best explained by the strong association of the social growth domain to activity level is very difficult to do.

Using either one of the inventories scores it was revealed that the females attitudes towards physical activity and their activity levels were not significantly related. Using the TOTAL score an F value, $F(8,288) = 1.76$, $p < .091$ was revealed while using the ACTTOT score an F value, $F(8,288) = 1.582$, $p < .0132$ was revealed. In both cases the females attitudes could only account for less than 10 percent of the variance in activity levels.

Interpretation of the regression analysis using all of the subjects in one sample group is not justifiable because the strong correlation is confounded with the gender differences. For similar reasons it is not justifiable to thoroughly examine the comparisons of the attitude-activity level relationships of subjects within one Program group to the other. A multiple regression analysis using both TOTAL and ACTTOT measures and attitude revealed significant F values for both Program groups (see Appendix L). Using the TOTAL score significant F values, $F(8,288) = 4.201$, $p < .001$ for Program 1 (Non daily) and $F(8,288) = 3.572$, $p < .001$ for Program 2 (Daily), were

revealed. Examination of the correlation data presented in Appendix L indicates that for the non-daily physical education program data, 20 percent ($R^2=.201$) of the variance in the activity levels can be explained by the strength of the attitudes towards physical activity while only 16 percent ($R^2=.165$) of the variance in activity levels of the subjects in the daily physical education program can be explained by their attitudes. Remarkably, similar results were generated using the ACTTOT score (see also Appendix L).

Smoll and Schutz (1980) had also found very weak relationships between attitude and involvement in their investigation of the stability of student's attitudes towards physical activity. However, they suggested that if the theoretical framework of attitude advocated by Ajzen and Fishbein (1977) was utilized a stronger relationship may be recognized. The results of this study suggest otherwise given that the CATPA inventory used was revised to support the new "action element" framework developed by Ajzen and Fishbein (1977).

Williams, Hughes, and Martin (1982) also found that there was an significant correlation between ATPA and students involvement in their assessment of 251 New Zealand children. The largest Pearson correlation (for the experimental group), $r=.550$ suggests that attitude explains 31 percent of the variance in participation. However, in this study, an obscure scoring procedure using the original CATPA inventory (Simon & Smoll, 1974) was utilized where all of the individual scores on the sub domains were added together to form one composite attitude score. This may have skewed the correlation results. Williams, Hughes, and Martin (1982) did not report any gender differences in their correlation results.

Smoll, Schutz and Keeney (1976) also examined the nature and degree of relationships between 264 children's attitudes towards physical activity and their levels of physical activity. Although significant canonical correlation coefficients were

revealed it was suggested that because of the lack of structure to account for these relationships they were deemed rather suspect and "probably resulted from the rather large number of variables in the attitude domain". In their investigation of the stability of attitudes across grades and over time Schutz and Smoll (1984) also revealed a significant, but low attitude-involvement relationship. With one of the subject groups (grade 10 females) it was determined that only 22.8 percent of the variability in the degree of participation could be accounted by the strength of the attitudes towards physical activity. They too found only two significant correlation coefficients (r) between the attitude domains and activity levels that could account for the significant relationship.

4.5. Relationship Between the Physical Activity Inventories

The measurement of physical activity levels has been an area under investigation for some time. Research to develop a reliable, valid and practical measurement tool has been rigorously pursued in the last decade. McGrath and Bailey (1990) have developed the PAQ-C in recent years but it has not been subject to statistical scrutiny. It is effective in that it acquires specific, descriptive information regarding physical activity behaviors but its lack of established validity limits its use as the principal measurement tool. In order to assess its effectiveness, further examination of the correlation statistics and multiple regression analysis was conducted to investigate the relationship between the PAQ-C and the Leisure Time Exercise Inventory.

Preliminary examination of the multiple regression analysis data presented in Table 4.4.1 and Table 4.4.2 revealed that, in general, the two instruments and their activity scores generated similar correlation coefficients with attitudes towards physical activity.

Pearson correlation coefficients were sought for each of the inventories and their composite values. Tables 4.5.1, 4.5.2 and 4.5.3 present the results of the correlation statistics.

Table 4.5.1 Correlation coefficients between LTEI and PAQ-C (all subjects)

	MILD	MOD	STREN	TOTAL	TAS	Q12TOT	ACTTOT
MILD	1.00						
MODERATE	0.220	1.00					
STRENUOUS	0.391	0.416	1.00				
TOTAL	0.582	0.587	0.895	1.00			
TAS	0.119	0.198	0.362	0.378	1.00		
Q12TOT	0.141	0.265	0.498	0.481	0.456	1.00	
ACTTOT	0.244	0.324	0.592	0.621	0.528	0.739	1.00

Table 4.5.2 Correlation coefficients between LTEI and PAQ-C (gender)

		MILD	MOD	STREN	TOTAL	TAS	Q12TOT	ACTTOT
Females								
MILD		1.00	0.099	0.201	0.438	0.073	0.116	0.212
MOD	M	0.252	1.00	0.443	0.718	0.178	0.338	0.439
STREN	a	0.468	0.390	1.00	0.886	0.256	0.431	0.651
TOTAL	i	0.650	0.544	0.882	1.00	0.272	0.452	0.577
TAS	e	0.131	0.194	0.387	0.403	1.00	0.469	0.568
Q12TOT	s	0.132	0.216	0.471	0.440	0.420	1.00	0.738
ACTTOT		0.248	0.261	0.569	0.597	0.482	0.692	1.00

Table 4.5.3 Correlation coefficients between LTEI and PAQ-C (Program)

		MILD	MOD	STREN	TOTAL	TAS	Q12TOT	ACTTOT
Program 1								
MILD	P	1.00	0.221	0.437	0.613	0.117	0.118	0.238
MOD	r	0.185	1.00	0.401	0.552	0.129	0.190	0.244
STREN	o	0.269	0.342	1.00	0.890	0.387	0.413	0.522
TOTAL	g.	0.519	0.636	0.883	1.00	0.374	0.373	0.541
TAS		0.110	0.366	0.302	0.372	1.00	0.320	0.494
Q12TOT	2	0.149	0.378	0.591	0.595	0.603	1.00	0.620
ACTTOT		0.236	0.456	0.670	0.711	0.566	0.827	1.00

The most important results of the correlation analysis is that the final activity scores (TOTAL and ACTTOT) for each of the two inventories shows a Pearson correlation of .577 for females and .597 for the males subjects (see Table 4.5.2). This may provide preliminary support for the PAQ-C inventory given that it is reasonably correlated with the validated Leisure Time Exercise Inventory (Godin & Shephard, 1984). However, it is apparent that these two inventories also measure different aspects of participation in physical activity. Examination of the scores and information provided by each of the inventories suggest that the TAS score from the PAQ-C and the TOTAL score from the LTEI are similar. The raw TAS (not averaged) score represents the number of times in the past seven days that the students were active in a variety of activities. If the sum of all of the data on the number of times students participated in activities of varying intensities is not multiplied by the respective METs the score should be reasonably close to the TAS raw score. The only difference is that the LTEI requires that the activity is participated in for more than 15 minutes and the PAQ-C does not. The correlation between the TAS score and the TOTAL score is only $r=.404$ for males and $r=.272$ for females. Further examination of the similarities and differences between these two inventories should be considered prior to subsequent research using these two inventories.

It is interesting that the females mean Strenuous score from the Leisure Time Exercise Inventory correlated highly with the ACTTOT score from the PAQ-C, $r=.651$. For the males the correlation between the Strenuous and ACTTOT score was $r=.569$. Therefore, one may suggest that the ACTTOT score provides information about moderate to strenuous activity levels given that the correlation between ACTTOT and the scores from the Leisure Time Exercise Inventory increases with the intensity of the activity the score represents. For example, for the female subjects (similarly with the males) the individual correlation coefficients between ACTTOT and the Mild, Moderate and Strenuous scores are $r=.212$, $r=.439$ and $r=.651$ respectively.

This also may suggest that given that the ACTTOT score is a valid measure then it follows that children's physical activity levels are best represented by the amount of their involvement in strenuous activities. This might translate into the assumption that children's activities are comprised primarily of strenuous activities or, they perceive their involvement as strenuous. Examination of the descriptive statistics suggest that this is true for the males but much the reverse for females who are most involved in mild activities therefore, this assumption may be rather weak.

In the analysis of the Leisure Time Exercise Inventory (Godin & Shephard, 1984) the TOTAL score correlated high with the Strenuous score for both males and females, $r = .882$ and $r = .886$ respectively. One may suggest that this Strenuous score may be a reasonable indicator of the total activity given that determining the intensity of the physical activities they participated in was not a concern. It is also possible that children can best identify with the most strenuous activities that they participate in.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The following is a summary of the findings of this study and a discussion of its practical implications. Some suggestions for further research will also be provided.

5.1 Summary of Findings

The purpose of this study was to determine if students involved in a program of daily physical education exhibited more positive attitudes towards, and participation in, physical activity than students involved in a non-daily physical education program. The secondary purpose of this study was to determine if a significant relationship exists between their attitudes towards physical activity and their levels of participation in physical activity. Grade 7 male and female children (N=297) from 10 elementary schools in the lower mainland were selected for this study. Their attitudes towards physical activity were assessed using the Children's Attitude Towards Physical Activity (Schutz, Smoll, Carre, & Mosher, 1985) and their levels of physical activity were measured using two inventories, the Leisure Time Exercise Inventory (Godin & Shephard, 1984) and the Physical Activity Questionnaire for Children (McGrath & Bailey, 1990).

The results of this study indicate that although there were no significant differences in the attitudes towards physical activity there was a significant difference in the levels of participation. The findings suggest that the daily physical education students participate more in physical activity than the non-daily students but their attitudes towards physical activity are generally the same. It was also determined that there were significant gender differences in the attitudes towards physical activity and the levels of physical activity. The females attitudes towards physical activity were less favorable towards the ascetic and vertigo domains of the attitude construct while the

males exhibited less favorable attitudes towards the aesthetic domain when compared to females. The males were significantly more active than the females but the difference was most significant for the levels of participation in strenuous activities and less significant in the moderate and mild physical activities. The results were generally consistent with the findings of earlier studies.

The results also show that there is a significant yet weak correlation between the attitudes and levels of participation in physical activities. Given this weak correlation and the fact that there were no significant attitude differences it is very difficult to explain the differences in activity levels. Bain (1980) may have helped to explain this by suggesting that students become more "socialized" into the role of active participants by developing regular physical activity patterns in the school based physical education program. In simpler terms, the students get into the habit of being active outside of the physical education instructional time if they are participants in a daily physical education program. Also, one would suspect that the students would reap the benefits of regular physical activity more frequently and to a greater degree having been active in the physical education class on a daily basis.

Further analysis of the physical activity inventories provided some other interesting information. Preliminary support for the PAQ-C inventory as a valid measurement tool was recommended given its moderate correlation with the TOTAL score taken from the validated Leisure Time Exercise Inventory (Godin & Shephard, 1984). It was also determined that male students levels of physical activity consisted mostly of strenuous activities while for the females they consisted primarily of moderate and mild activities. This finding is comparable to other research findings and therefore can provide support for the use of these inventories in identifying gender differences and classifying children's activity patterns.

5.2 Practical Implications

The ultimate goal of this study was to provide additional support for Quality Daily Physical Education programs. It was hypothesized that the children involved in daily physical education programs would exhibit more positive attitudes towards physical activity and would be more physically active. These two student variables (attitude and activity levels) were chosen because it was felt that they represent the most primary objectives or long term goals of school based physical education programs. In terms of the lack of attitude differences, the results could be perceived by the proponents of daily physical education as a set back. Some possible reasons for the lack of differences have been suggested which put the results of this study in perspective. We cannot advocate daily physical education based on its effect on attitudes alone but there is an abundance of literature to justify the inclusion of a daily physical education program based on other student outcomes. Furthermore, this study has determined that the provision of daily physical education positively affects children's levels of physical activity. This is a profound finding and should be addressed as a major rationale for the implementation of a daily physical education program. The extensive review of the literature presented in this study identified a number of positive effects that a daily physical education program has on the students affective, psychomotor, and cognitive learning domains in addition to its health related components

Perhaps the quality of the physical education experience needs to be emphasized even further. If the frequency and amount of physical education have no apparent impact on the student's attitude towards physical activity it is clear that the quality of the children's experience, in addition to the parental and peer influences and other environmental factors, may have the most significant impact on the their attitude towards physical activity. The quality of the experience that is essential would include aspects such as the instruction, student-teacher interaction (feedback, reinforcement),

student and group interaction, structure of the learning experiences and essential curriculum components. If a child was involved in an ineffective, unpleasant physical education program then for that child to experience it on a daily basis would be even more damaging to their attitude and activity levels outside of school than to have a physical education class only 2-3 days each week. In fact, a quality physical education program should be a prerequisite to the adoption of a daily program so damaging effects can be avoided.

It may also be speculated that the effects of a daily physical education program may not be realized until after at least two years of involvement. This could serve as one rationale for ensuring that children are receiving quality, daily physical education in their early years of elementary school so that the benefits are being experienced from an earlier age and for a longer period of time.

5.3 Recommendations for Further Research

Based on the findings of this study and the interpretation of these results a number of research areas that need to be investigated have presented themselves.

It was determined that the children involved in the daily physical education program were significantly more active than their peers in a non daily physical education program. Which aspects of a program of a daily physical education are contributing to greater levels of participation in physical activity must eventually be determined. These results have strong implications for research on the determinants of children's levels of physical activity and also for identifying the precursors to adult physical activity patterns and the role of childhood involvement.

The psychological and psychosocial processes that can be involved in the impact that daily physical education has on students' attitudes towards physical activity must be investigated. A stronger rationale and scientific reasoning for the

traditional statement that daily physical education improves students attitudes towards physical activity (Hansen & McKenzie, 1990) must be developed.

It has been proposed that the effects of a daily physical education program may take more than two years to be realized. Given this suggestion, a more fruitful approach to this area of research would be a longitudinal study in which the same students variables were measured before and after a three to five year involvement in a quality daily physical education program. This may provide more valuable information about the effects of quality, daily physical education. Also, in future studies the quality of the programs should be more heavily scrutinized before making comparisons between daily and non-daily programs.

The third hypothesis that suggested student's attitudes towards physical activity are positively related to their levels of physical activity should also be more closely examined. It is obvious that there are many determinants of student's attitude towards physical activity but the role of the physical education program, and its features (curriculum, instruction, objectives etc.) in developing and shaping attitudes must be more specifically determined. Equally important is investigating the role of attitude in developing active lifestyles. The relationship must be more closely examined to determined why it has been consistently significant, yet low, and what attitude domains are contributing to the relationship's strength or weakness. As suggested in other research (Patterson & Faucette, 1990; Williams, Hughes, & Martin, 1982) the role of the CATPA inventory (Schutz, Smoll, Carre, & Mosher, 1985) in assessing attitude and developing this attitude-behaviour relationship must also be closely examined to see if it can help explain this weak relationship.

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APPENDIX A

Ethics Review Committee Approval Form

APPENDIX B**Initial Letter to School Districts**

THE UNIVERSITY OF BRITISH COLUMBIA



Mr. Blake Ford
Director of Instruction
Burnaby School District
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V5G 1W2

School of Physical Education and Recreation
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Vancouver, B.C. Canada V6T 1Z1
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Dear Mr. Ford

The purpose of this letter is to seek approval and support of a proposed Physical Education research study that is somewhat of a follow-up to a small attitude towards physical activity study I did in 4 schools of the Burnaby school District last year. I have already spoken with Ed Silva White and he suggested that I seek approval from you before I continue with this project.

The purpose of this Master's Thesis study is to investigate some of the assumptions about daily Physical Education. Particularly, we would like to assess students' attitudes towards physical activity as well their activity levels and patterns and determine whether or not there exists any significant differences between students involved in a program of daily Physical Education and students involved in a program of non-daily Physical Education. Results from this study will help provide us with some understanding of the determinants of attitudes towards physical activity and determinants of active lifestyles.

The study will include a total of 10 schools. Five of these will have programs of daily Physical Education and five will have programs of non-daily Physical Education. It is planned that 20 -25 Grade 7 students will be administered both a questionnaire and inventory which I have enclosed. Cooperation from the teacher will be required as this will be done during a convenient class time and will take approximately 20 minutes. Upon district approval I will contact each of the schools to seek approval and make necessary arrangements. I have also enclosed a copy of the parental consent forms that the students will have their Parents or Guardians sign for approval.

The time line for this study suggests that we will be able to administer the questionnaires throughout the week of May 15-25.

I stress that the purpose of this study is to measure differences in attitudes towards, and participation in, physical activity and not Physical Education and is therefore not an evaluation of any of

APPENDIX C

Description of Participating Schools

School Program Description

Program/School	Physical Education Program Description (# of P.E. classes and total time)	
Program 1 Non-Daily		
School 1	2 @ 20 min., 1 @ 35 min	95 minutes
School 2	2 @ 25 min., 1 @ 40 min.	90 minutes
School 3	3 @ 30 min.	90 minutes
School 4	2 @ 40 min., 1 @ 20 min.	100 minutes
School 5	3 @ 30 min.	90 minutes
Program 2 Daily		
School 6	4 @ 35 min., 1 @ 60 min.	200 minutes
School 7	5 @ 35 min.	175 minutes
School 8	4 @ 35 min., 1 @ 40 min.	180 minutes
School 9	4 @ 40 min., 1 @ 30 min.	190 minutes
School 10	4 @ 30 min., 1 @ 45 min.	165 minutes

Note: Each of the classes in each of the schools meet the criteria outlined in sections 3.1.1, 3.1.2 and 3.1.3.

APPENDIX D

Initial Contact Letter to Schools

APPENDIX E
Parental Consent Form

APPENDIX F

Cover Sheet for Student Questionnaires and Inventories

APPENDIX G

Children's Attitude Towards Physical Activity (CATPA) Inventory

Childrens' Attitudes Towards Physical Activity Inventory

Jeffrey Hunt
Graduate Student, University of British Columbia

Dr. Alex Carre
Associate Professor, University of British Columbia

Gender: _____ Girl _____ Boy

Age: _____ Years _____ Months

This questionnaire is designed to find out how you feel about taking part in physical activity. Physical activities are games, sports, and dance such as bike riding, hiking, soccer, swimming, jogging, gymnastics, and square dancing. These physical activities may or may not be part of organized programs such as physical education classes, school sports, or community sports.

At the top of each page in the booklet there is a box , and in this box there is an idea. Below the box are five different pair of words. Please put an X along the scale between the word pairs to show how you feel about the idea. This is not a test. There are no right or wrong answers. If you do not understand the idea in the box, put an X in the I DO NOT UNDERSTAND box at the top of the page.

Do not worry or puzzle over individual items. It is your first impressions, the immediate "feelings" about the ideas, that we want. On the other hand, please do not be careless because we want your true impressions.

How do you feel about the idea in the box?

PHYSICAL ACTIVITY FOR SOCIAL GROWTH

Taking part in physical activities which give you
a chance to meet new people.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____:_____:_____:_____:_____ bad
2. of no use _____:_____:_____:_____:_____ useful
3. not pleasant _____:_____:_____:_____:_____ pleasant
4. nice _____:_____:_____:_____:_____ awful
5. happy _____:_____:_____:_____:_____ sad

How do you feel about the idea in the box?

PHYSICAL ACTIVITY FOR HEALTH AND FITNESS

Taking part in physical activities to make your health better and to get your body in better condition.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____ : _____ : _____ : _____ : _____ bad
2. of no use _____ : _____ : _____ : _____ : _____ useful
3. not pleasant _____ : _____ : _____ : _____ : _____ pleasant
4. nice _____ : _____ : _____ : _____ : _____ awful
5. happy _____ : _____ : _____ : _____ : _____ sad

How do you feel about the idea in the box?

PHYSICAL ACTIVITY AS A THRILL BUT INVOLVING SOME RISK

Taking part in exciting physical activities that could be dangerous because you move very fast and must change direction quickly.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____ : _____ : _____ : _____ : _____ bad
2. of no use _____ : _____ : _____ : _____ : _____ useful
3. not pleasant _____ : _____ : _____ : _____ : _____ pleasant
4. nice _____ : _____ : _____ : _____ : _____ awful
5. happy _____ : _____ : _____ : _____ : _____ sad

-5-

How do you feel about the idea in the box?

PHYSICAL ACTIVITY TO CONTINUE SOCIAL RELATIONS

Taking part in physical activities which give you
a chance to be with your friends.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____ : _____ : _____ : _____ : _____ bad
2. of no use _____ : _____ : _____ : _____ : _____ useful
3. not pleasant _____ : _____ : _____ : _____ : _____ pleasant
4. nice _____ : _____ : _____ : _____ : _____ awful
5. happy _____ : _____ : _____ : _____ : _____ sad

-6-

How do you feel about the idea in the box?

PHYSICAL ACTIVITY AS THE BEAUTY IN HUMAN MOVEMENT

Taking part in physical activities which have beautiful and graceful movements.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____ : _____ : _____ : _____ : _____ bad
2. of no use _____ : _____ : _____ : _____ : _____ useful
3. not pleasant _____ : _____ : _____ : _____ : _____ pleasant
4. nice _____ : _____ : _____ : _____ : _____ awful
5. happy _____ : _____ : _____ : _____ : _____ sad

-7-

How do you feel about the idea in the box?

PHYSICAL ACTIVITY FOR THE RELEASE OF TENSION

Taking part in physical activities to reduce stress
or to get away from problems you might have.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____ : _____ : _____ : _____ : _____ bad
2. of no use _____ : _____ : _____ : _____ : _____ useful
3. not pleasant _____ : _____ : _____ : _____ : _____ pleasant
4. nice _____ : _____ : _____ : _____ : _____ awful
5. happy _____ : _____ : _____ : _____ : _____ sad

-8-

How do you feel about the idea in the box?

PHYSICAL ACTIVITY AS LONG AND HARD TRAINING

Taking part in physical activities that have long and hard practices. To spend time in practice you need to give up other things you like to do.

Always Think About the Idea in the Box

If you do not understand this idea,
mark this box ☐ and go to next page.

1. good _____:_____:_____:_____:_____ bad
2. of no use _____:_____:_____:_____:_____ useful
3. not pleasant _____:_____:_____:_____:_____ pleasant
4. nice _____:_____:_____:_____:_____ awful
5. happy _____:_____:_____:_____:_____ sad

APPENDIX H

Physical Activity Questionnaire for Children (PAQ-C)

Physical Activity Questionnaire for Children

(McGrath and Bailey, 1990)

Name: _____ Age: _____ Sex: M _____ F _____
 Grade: _____ Teacher: _____ Date: _____

We are trying to find out about your physical activity levels that you have done IN THE LAST 7 DAYS (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe harder, like tag, skipping, running, climbing and others.

REMEMBER:

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

1. PHYSICAL ACTIVITY

Have you done any of the following activities in the **PAST 7 DAYS** (last week)? If yes, how many times?

****Tick Only One Box Per Row****

	No	1-2	3-4	5-6	7 times or more
Skipping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Four Square	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creative Playground	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tag	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walking for exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jogging or running	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aerobics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baseball, softball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Football	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Badminton	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skateboarding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soccer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Street hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volleyball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floor hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basketball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice skating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-country skiing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice hockey/Ringette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other:

_____ ☐ ☐ ☐ ☐ ☐

_____ ☐ ☐ ☐ ☐ ☐

2

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

I don't do PE ☐
 Hardly ever ☐ check
 Sometimes ☐ one
 Quite often ☐ only
 Always ☐

3. In the last 7 days, what did you do most of the time AT RECESS?

Sat down (talking, reading, doing school work) .. ☐
 Stood around or walked around..... ☐ check
 Ran or played a little bit..... ☐ one
 Ran around and played quite a bit..... ☐ only
 Ran and played hard most of the time ☐

4. In the last 7 days, what did you normally do AT LUNCH (besides eating lunch)?

Sat down (talking, reading, doing school work) .. ☐
 Stood around or walked around..... ☐ check
 Ran or played a little bit ☐ one
 Ran around and played quite a bit..... ☐ only
 Ran and played hard most of the time..... ☐

5. In the last 7 days, on how many days RIGHT AFTER SCHOOL, did you do sports, dance, or play games in which you were very active?

None ☐
 1 time last week..... ☐ check
 2 or 3 times last week ☐ one
 4 times last week ☐ only
 5 times last week ☐

6. In the last 7 days, on how many EVENINGS did you do sports, dance, or play games in which you were very active?

None ☐
 1 time last week..... ☐ check
 2-3 times last week ☐ one
 4-5 times last week ☐ only
 6-7 times last week ☐

3

7. ON THE LAST WEEKEND, how many times did you do sports, dance, or play games in which you were very active?

- None ☐
 1 time ☐ check
 2 - 3 times ☐ one
 4 - 5 times ☐ only
 6 or more times ☐

8. Which ONE of the following describes you best for the last 7 days?

****Read ALL FIVE statements before deciding on the one answer that describes you****

A) All or most of my free time was spent doing things that involve little physical effort (e.g., watching TV, doing homework, playing computer games or Nintendo). ☐

B) I sometimes (1 - 2 times last week) did physical things in my free time (e.g., played sports, went running, swimming, bike riding, did aerobics). ☐ check

C) I often (3 - 4 times last week) did physical things in my free time. ☐ one

D) I quite often (5 - 6 times last week) did physical things in my free time. ☐ only

E) I very often (7 or more times last week) did physical things in my free time. ☐

4

9. How many hours per day did you watch television or play Nintendo last week? (each show is usually a half hour or 30 minutes)

- A) I watched less than 1 hour or have no TV ☐
 B) I watched more than 1 hour but less than 2 ☐ check
 C) I watched more than 2 hours but less than 3 ☐ one
 D) I watched more than 3 hours but less than 4 ☐ only
 E) I watched more than 4 hours ☐

10. Were you sick last week, or did anything prevent you from doing your normal physical activities?

Yes ☐
 No ☐
 If Yes, what prevented you? _____

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

	None	Little Bit	Medium	Often	Very Often
A) Monday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B) Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C) Wednesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D) Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E) Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F) Saturday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G) Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX I**Leisure Time Exercise Inventory (LTEI)**

LEISURE TIME EXERCISE/ACTIVITY QUESTIONNAIRE

Jeffrey Hunt
School of Human Kinetics, U.B.C.

Dr. Alex Carre
School of Human Kinetics, U.B.C.

1. Considering a 7 day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time . Do not consider that exercise you get in your Physical Education class. Write in each box the appropriate number.

Times Per
Week

a) Strenuous Exercise

(Heart Beats Rapidly)

(ie. running, jogging, hockey,
basketball, judo, roller skating,
vigorous swimming, vigorous cycling)

b) Moderate Exercise

(Not Exhausting)

(ie. fast walking, baseball, tennis,
easy cycling, volleyball, badminton,
easy swimming, dancing, skateboarding)

c) Mild Exercise

(Minimal Effort)

(ie. archery, fishing, bowling, golf,
walking, hackysack, easy walking)

2. Considering a 7 day period (a week) during your leisure time how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly) ?

_____Often_____Sometimes_____Never or Rarely

APPENDIX J**Participant 7 Day Activity Recall Inventory**

For each day of the week indicate how many times you do more than 15 minutes of the different types of exercises. Different periods of the day are included to help you recall.

After completing the chart add up all the numbers for each day to get a total for the week. Do this for each type of exercise and enter the total in the appropriate circle on the next page.

A. Strenuous Exercises (Heart Beats Rapidly) eg. running, jogging, hockey, basketball, soccer, vigorous swimming, vigorous bicycling.

Time Period	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Morning							
Lunch							
After School							
After Dinner							

B. Moderate Exercise (Not Exhausting)

eg. fast walking, baseball, badminton, easy swimming, dancing, skateboarding, volleyball, easy cycling.

Time Period	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Morning							
Lunch							
After School							
After Dinner							

C. Mild Exercise (Minimal Effort)

eg. fishing, archery, golf, bowling, walking, hackysack, easy walking.

Time Period	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Morning							
Lunch							
After School							
After Dinner							

APPENDIX K
Teacher Questionnaire

School.
Program:
Code (G):

An Investigation of a Program of Daily Physical Education

Jeffrey Hunt
School of Human Kinetics, U.B.C.

Teacher Questionnaire

The following questions are designed to provide us with some information that might help to explain some of the relationships between student parameters (attitude towards, and participation in, physical activity) and the Physical Education program they are involved in.

Please do not write your name or the school in which you work this questionnaire as we want to maintain complete confidentiality. You do not have to answer any of these but please understand that once you answer any questions your participation in, and support for, this study is implied.

1. State the number of years of teaching experience at the elementary level:

Years of experience at the Grade 7 level:

Years of experience teaching Physical Education:

Years of experience teaching Grade 7 Physical Education:

2. Place a check beside the sentences that describe your educational background:

_____ Physical Education Degree (eg. B.P.E.; B.H.K.; B.Sc.)
Please indicate:

_____ Teacher Education Program (eg. B.Ed.-1 yr. or B.Ed.-2 yr.)
Please indicate:

_____ Physical Education Teacher Education Program
(eg. 4 (5) year B.Ed. with P.E. concentration)

_____ 5th Year Diploma Program with a specialization in Physical Education

_____ Physical Education Graduate Work (M.P.E.; M.Ed. or M.A with a specialization in Physical Education. Please indicate:

_____ Other... Please explain:

3. State which of the following organizations or associations you are actively involved in:

_____ Physical Education Specialist Association (PEPSA)

_____ Canadian Association for Health, Physical Education and Recreation (CAHPER)

_____ Physical Education Society of British Columbia

_____ Other (please indicate):

4. State the approximate number of workshops or seminars in the area of Physical Education, Recreation or Dance that you have attended in the 1992-1993 school year:

5. Use a check mark to indicate the extent to which you use the Burnaby/Coquitlam Physical Education Curriculum and Instruction Guide supplied to you:

|-----|-----|-----|-----|
Never Always

Indicate any other Curriculum and Instruction resources you may use:

6. Indicate the approximate percentage of your students that you feel are active to the various extents in the following activities

a) Strenuous (heart beats rapidly ie. running, swimming)

_____ Not at all _____ Sometimes _____ Always _____ Do not know

b) Moderate (not exhausting ie. baseball, tennis)

____ Not at all ____ Sometimes ____ Always ____ Do not know

c) Mild exercise (ie. golf, easy walking, bowling)

____ Not at all ____ Sometimes ____ Always ____ Do not know

7. Place a check-mark beside the sentence that best describes your teaching situation at this school in this present 1992-1993 year:

____ You are the Physical Education Specialist who teaches most or all of the Physical Education classes in your school.

____ You are a classroom teacher who teaches only your students' Physical education class.

____ You are a classroom teacher who teaches your own Physical Education class and a specific number of other Physical Education classes in your school. Please indicate the number of additional classes you teach.

____ Other...(please explain)

8. Please describe the content of your Grade 7 Physical Education class for the past 5 days of the school week:

1.

2.

3.

4.

5.

9. Indicate the approximate percentage of instructional time spent in the following areas during the 1992-1993 school year with your Grade 7 class:

____ Outdoor Pursuits

____ Dance

____ Gymnastics

____ Aquatics

____ Fitness and Lifestyle

____ Cooperative Games

____ Team Sports

____ Individual/Dual Sports

Please list:

Please list:

____ Other

APPENDIX L

Relationship Between Activity Levels and ATPA

:Multiple regression analysis using TOTAL and ACTTOT

**1. Multiple regression analysis for attitude-participation relationship
: TOTAL activity score (Program 1 vs Program 2)**

Multiple Regression Analysis				
	Program 1 (N=143)		Program 2 (N=139)	
Squared Multiple R	0.201		0.165	
Variable	t value	P (2 Tail)	t value	P (2 Tail)
Aesthetic	-2.914	0.004	-1.019	0.310
Ascetic	2.823	0.005	1.361	0.176
Cathartic	-0.356	0.722	1.902	0.059
HF Enjoy	1.350	0.179	-0.060	0.936
HF Value	-0.736	0.463	-0.051	0.960
Relations	1.087	0.279	-1.972	0.051
Social	-0.010	0.982	2.402	0.018
Vertigo	1.436	0.153	2.155	0.033
F(8,288) p	4.201	< 0.001	3.572	< 0.001

**2. Multiple regression analysis for attitude-participation relationship
: ACTTOT activity score (Program 1 vs Program 2)**

Multiple Regression Analysis				
	Program 1 (N=143)		Program 2 (N=139)	
Squared Multiple R	0.200		0.176	
Variable	t value	P (2 Tail)	t value	P (2 Tail)
Aesthetic	-3.349	0.001	-0.168	0.867
Ascetic	3.004	0.003	0.594	0.553
Cathartic	0.268	0.774	1.070	0.287
HF Enjoy	1.221	0.224	0.313	0.755
HF Value	-0.140	0.889	0.767	0.433
Relations	0.486	0.628	-3.799	0.001
Social	1.322	0.189	2.327	0.021
Vertigo	0.938	0.350	1.968	0.051
F(8,288) p	4.187	< 0.001	3.871	< 0.001