

Footprints: Engaging Youth to be Physically Active in Nature through Photovoice

by

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BA, University of the Fraser Valley, 2005

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## ABSTRACT

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Although being physically active while exposed to nature may have synergistic health benefits and help develop environmental values, many youth today are inactive and disengaged from the natural environment. The purpose of this study was to explore adolescents' knowledge, attitudes, skills, behaviours, and general perspectives on engaging with the environment through physical activity using a social marketing lens. Social marketing is a behaviour change strategy that involves the 'use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behaviour for the benefit of individuals, groups, or society as a whole'. To address this purpose, three research questions were answered: what are youths' perspectives of and experiences with physical activity in the natural environment; what strategies do youth recommend for engaging with nature as a way to be active, and; how do participants' Photovoice projects on health and nature, including subsequent discussion of these projects, influence their conscientization of health in relation to nature? A purposive sample of eight grade 12 students enrolled in an elective sustainability and eco-education course participated in this study. Participants were asked to express their perspectives on being physically active in nature by completing a Photovoice project (including photos and captions) and engaging in group discussion. The action component of Photovoice was fulfilled through a presentation to the local

school board. Thematic analyses of discussion transcripts, Photovoice projects, and presentation notes were guided by a social marketing lens. Themes described these youth in terms of relevant product, purchaser, price, place, and promotion for the subject of physical activity in nature. The youth believed engaging in nature through physical activity provided them with freedom, excitement, creativity, and relaxation, along with health and educational benefits, and had few or no disadvantages. Suggested strategies for engagement were framed in the shape of a tree to describe their applicability to youth at different present levels of engagement, ranging from simply spending time in nature (the roots), to challenging oneself by interaction with nature, thus resulting in better health (the branches). The Photovoice projects led to increased awareness of human-nature relationships for participants. Themes may inform decision makers of youth perspectives and thus guide development of future programs and initiatives in this area.

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## CHAPTER ONE

### Introduction

Among many health concerns, adolescents today are faced with the consequences of two health issues: their physical inactivity levels and their disengagement from the natural environment. Physical inactivity is correlated with several chronic diseases, such as cardiovascular disease, type 2 diabetes, colon and breast cancer, and osteoporosis; increased risk of premature death (Warburton, Whitney Nicol, & Bredin, 2006); and lower levels of mental well-being (Pretty, Peacock, Sellens, & Griffin, 2005). Conversely, physical activity counteracts many of the negative physical health effects of inactivity (Warburton et al., 2006) and has positive effects on anxiety symptoms (O'Connor, Raglin, & Martinsen, 2000) and depressive symptoms (O'Neal, Dunn, & Martinsen, 2000). Furthermore, physical activity may have protective effects on youth, preventing the development of emotional problems by increasing levels of self-esteem, body image, and self-concept (Calfas & Taylor, 1994). Despite the many benefits of being physically active and detriments of being physically inactive, between 50 and 79% of adolescents are not active enough to derive health benefits, depending on the criteria applied (CFLRI, 2005; Stone, McKenzie, Welk, & Booth, 1998). This is especially problematic given that physical activity levels tend to decline with age, particularly in the transition between adolescence of adulthood (Stone et al., 1998).

There are also health consequences associated with lack of contact with healthy nature or contact with unhealthy nature, including respiratory illness (Premaratna, Pathmeswaran, Chandrasekara, Dissanayake, & De Silva, 2002) and mental illness (Pretty, Griffin, & Sellens, 2004). On the other hand, contact with a healthy natural

environment is associated with feelings of enjoyment and relaxation and reductions in stress (Kaplan & Kaplan, 1989); increased levels of job, home, and general life satisfaction (Kaplan & Kaplan); increased longevity and levels of physical activity (Takano, Nakamura, & Watanabe, 2002); and overall health and well-being (De Vries, Verheij, Groenwegen, & Spreeuwenberg, 2003; Stone, 2006; Takano et al., 2002).

Unfortunately, there is evidence that the health of the environment is declining (Dayton, 2003; Weinstein, 2005) and that a number of factors are resulting in youth having less contact with the natural environment than in previous generations, including longer school hours, increased institutionalization, lack of parental supervision for outdoor play (Rivkin, 1997), increased urbanization resulting in less green space (Tzoulas, Korpela, Venn, Yli-Pelkonen, Kazmierczak, et al., 2007), and a greater amount of time spent in screen viewing activities (Leatherdale & Wong, 2008; Shields, 2006). Adolescents' perspectives on environmental issues generally reflect concern for the environment (Jenkins & Pell, 2006) but also reflect anger and frustration over the lack of action being taken and a sense of hopelessness about the future, resulting in a state of action paralysis (Connell, Fein, Lee, Sykes, & Yencken, 1999). When proenvironmental attitudes do exist, there is evidence for an increase in self-reported proenvironmental behaviour (Meinhold, & Malkus, 2005). Early experiences with nature may help to develop environmental values (Chawla, 1999; Place, 2004). Therefore, increasing adolescent contact with nature could translate into an increase in proenvironmental attitudes and behaviours.

Beyond the individual health benefits of spending time in nature and of physical activity, there is evidence of a synergistic benefit of being physically active while being

exposed to nature (Krenichyn, 2006; Pretty, Peacock, Hine, Sellens, South, et al., 2007; Pretty et al., 2005). Furthermore, there is some evidence that both personal and environmental health are affected concurrently through physically active environmental stewardship (Birch, 2005; Moore, Townsend, & Oldroyd, 2006). Combining physical activity and contact with nature could effectively target the health of adolescents while engaging them with the natural environment to encourage the development of proenvironmental attitudes and behaviours.

Evidence shows that youth participation in initiative development and understanding youths' views are both very important elements in the success of behaviour change strategies (Chawla, 2002; Cook, 2008). The purpose of youth participation is to fairly and accurately represent youth perspective on an issue. The principles of social marketing emphasize the importance of researching and understanding the specific needs, beliefs and attitudes of a target population with respect to a desired behaviour in order to effectively inform future policy and program development (Kotler, Roberto, & Lee, 2002). Studies that involve adolescents in program development report increased participation and an increased sense of project ownership among participants (Skinner, Morrison, Bercovitz, Haans, Jennings, et al., 1997).

Furthermore, whereas some traditional research methodologies may lack the ability to excite and engage youth in health promoting activities, there is evidence that Photovoice is an effective strategy for actively engaging youth in exploration and expression of their own health issues (Necheles, Chung, Hawes-Dawson, Ryan, Williams et al., 2007). Photovoice represents youth perspective rather than relying on what decision makers assume are youths' problems and corresponding solutions (Chio &

Fandt, 2007), and also involves participants in the process of social action. Thus, in terms of social marketing, it is an appropriate methodology to gain an understanding of the audience's perspectives. Furthermore, because this methodology allows for small group discussion and requires critical reflection and dialogue (Wang & Burris, 1997), it provides an excellent opportunity for environmental and health education by encouraging greater "consciousness of self" and awareness of differences in the perspectives of others (Chio & Fandt, 2007). Thus, the purposes of this study were threefold: 1.) to understand youth perspectives on engaging with the natural environment through physical activity and the effects on health; 2.) to use Photovoice projects and discussion as tools for conscientization/health education/awareness; and 3.) to use these ideas to present to policy makers to initiate action.

### *Statement of Problem*

Youth today are faced with health issues related to low levels of physical activity and low levels of contact with the natural environment. Little contact with the natural environment may mean a lower rate of pro-environmental attitudes and behaviours, and therefore may also have consequences for environmental health.

### *Research Questions*

1. What are youths' perspectives of and experiences with physical activity in the natural environment?
2. What strategies do youth recommend for engaging with nature as a way to be active?
3. How do participants' Photovoice projects on health and nature, including subsequent discussion of these projects, influence their conscientization of health in relation to nature?

### *Assumptions*

1. Photovoice is an effective method for understanding adolescents' perspectives on engaging with the natural environment and health.
2. Adolescent participants are interested in presenting their perspectives on these issues to decision makers.
3. Participants will be truthful in their responses.

### *Operational Definitions*

The following terms are defined based on the descriptions and explanations of the concepts as described by the youth participants during the orientation session:

1. *Physical activity*: Activities that produce sweat, increase heart rate, and/or exercise the cardiovascular system. Being physically active implies that one is not engaged in anything sedentary, such as watching television or movies.
2. *Engaging with nature*: Engaging with nature implies physical interaction with it. It refers to what one is doing for and/or with nature, and in turn, it also acknowledges that nature contributes to one's senses and affects one's health.
3. *Health*: Involves physical, mental/psychological, and social/relational aspects. Good health is the result of eating well, getting lots of exercise, having a positive social life, getting enough sleep, and experiencing new things. Challenging oneself through interactions with the natural environment is also an important aspect of health as it encourages goal setting and higher levels of achievement.<sup>1</sup>
4. *(Healthy) Environment*: Having a healthy environment means having 'clean' natural and organic surroundings (e.g., air) and the presence of lots of wildlife, forests and other life forms.<sup>2</sup>

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<sup>1</sup>According to the World Health Organization (WHO), "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1946, p.100). The definition of health provided by the youth resonates with the WHO's definition of health. Beyond these characteristics, however, although the youth did not overtly state it in their definition of health, it is implied in their Photovoice projects and later discussion that their health definition may also include aspects of awareness and understanding of others and their environments, as well as a sense of social responsibility toward others and the natural world surrounding them.

<sup>2</sup> While this definition does not mention humans as a part of the environment, the youth later express an understanding of the interconnectedness that exists between humans and natural world, and how the health of one is connected to the health of the other. Also, social interaction with other people is included in their definition of health. As such, it is suggested that humans who are conscious of human-nature relationships can be part of a healthy environment.

*Dilemmas in Methods and Interpretation*

Data will reflect experiences, ideas, and opinions of adolescents enrolled in an elective high school course in sustainability and eco-education, thus may not be representative of other adolescents with environmental interests or experiences. Thus, caution should be advised in interpreting the results of the study because they may not be transferable to adolescents beyond this particular course. As well, participants may have been influenced by my perspectives as the researcher, particularly during the discussion group.

This thesis is organized in the following fashion: chapter two is a review of literature relevant to this study; chapter three describes the methods, including the participant recruitment, data collection, data analysis, and considerations related to ethics and data trustworthiness; the fourth chapter describes the project results, as organized into themes rooted in the study framework, social marketing; finally, the fifth chapter includes a discussion of the results as they relate to the literature and the implications of this thesis for future research and practice.

## CHAPTER TWO

### Literature Review

Adolescents today are faced with a number of personal health concerns.

Adolescent overweight and obesity are reaching near epidemic levels (Tremblay, 2007).

Overweight and obesity are associated with a myriad of immediate medical complications, such as disrupted sleep patterns, orthopaedic complications and poor immune function (Wabitsch, 2000), and long-term health consequences including type 2 diabetes, hypertension, and stroke (Katzmarzyk, Gledhill, & Shephard, 2000).

Furthermore, child and adolescent rates of psychological disorders such as depression (Delate, Gelenberg, Simmons, & Motheral, 2004) are concerning, and result in a number of social and behavioural complications. While these health issues have multiple causes, overall adolescent health is certainly affected by two issues: physical inactivity levels and decreasing contact with the natural environment. In turn, physical activity and contact with nature both drastically contribute to the state of overall adolescent health. In an era where a shift is occurring from a treatment-focused approach to health care to one of health promotion and achievement of wellness, researchers and professionals alike are constantly searching for factors, such as physical activity and contact with nature, that contribute to a holistic state of health.

Definitions of health have expanded to incorporate multiple contributors for health. For example, as stated by the World Health Organization (WHO, 1947), health is “not merely the absence of disease or infirmity... [but] a state of complete physical, mental, and social well-being” (p.13). Thus, being healthy means achieving a state of wellness in several spheres, and as such, a number of factors in genetics and environment

interact to produce overall health. Therefore, research should acknowledge and attend to the multiple components of health. This study promoted the concept of holistic wellness by bridging important population health and environmental health needs. Specifically, it explored youth perspectives on engaging with the natural environment through physical activity, with the intent of informing future program and policy development related to youth and environmental health, and environmental values.

This chapter begins with a brief discussion of holistic health models, and then goes on to review the current state of environmental health, adolescent environmental views, and the health consequences related to the lack of adolescent-nature interactions. Next, current adolescent physical activity levels and the benefits associated with being physically active, particularly in a nature context, are discussed, as well as the consequences associated with a lack of physical activity. Finally, the chapter ends with descriptions of the study framework (social marketing) and the methodology used (Photovoice), and the purpose, respectively.

### *Holistic Health Models*

Recent health promotion frameworks, such as the social ecological model and the settings based approach, emphasize the importance of context in being healthy. It is known that creating ecological, multi-level interventions is the most powerful approach to achieve significant change. A settings-based approach recognizes an ecological, multi-level and whole systems perspective (Dooris, Poland, Kolbe, de Leeuw, McCall et al., 2007) where “health is created and lived by people within the settings of their everyday life; where they learn, work, play and love” (WHO, 1986, p.2). A ‘setting’ can be a physical place or a social context where multiple environmental, organizational and

personal factors come together to affect health (WHO, 1998). As Howard Frumkin noted in his 2003 publication *Healthy Places: Exploring the Evidence*, “some places are romantic, and some places are depressing. There are places that are peaceful, places that are frightening and places that are safe. We like some places better than others. Place matters” (p. 1451). Because the impact of place has emerged as an important concern for health and learning, the health promotion and educational sectors have identified settings-based programs and interventions as an important strategy. In health promotion, a settings-based approach is seen as a more effective way to improve people’s health and health behaviour because the emphasis is on changing settings (e.g., workplace, schools) instead of individuals (Whitelaw, Baxendale, Bryce, Machardy, Young et al., 2001).

Like the settings-based approach, the social ecological model also acknowledges a holistic definition of health by suggesting that individual health is a product of our environments, our social networks, our lifestyle choices, and our biological composition. Not only are individuals affected by various levels of influence, but, in turn, they are also able to exert effect. Stokols (1992) outlines a number of assumptions of the social ecological perspective. First, both the healthfulness of a situation and of its participants are influenced by physical and environmental factors, including personal attributes, psychological dispositions and behavioural patterns, and therefore health promotion intervention efforts should account for the interplay between these factors. It makes sense then that health and health promotion should address the multidimensional and complex nature of human environments. Furthermore, the participants in environments can be studied at different levels ranging from the individual level to the population level. Another component of social ecological theory is the element of transactional

relationships between people and the environment, characterized by cycles of mutual influence. That is, settings influence the health of the occupants, and concurrently the occupants affect the healthfulness of their settings (Stokols, 1992).

### *Health and the Natural Environment*

In keeping with the social ecological model and a settings-based approach, the “biophilia hypothesis” suggests there is a hard-wired human need to affiliate with natural environments, just as there is a need to affiliate with people (Kellert, 1993). According to this theory, when this need is not met, human health suffers. A recently conducted literature review of the impact of contact with nature on human health confirmed that the biophilia hypothesis seems to be well supported, and further, that part of the positive health effects are a result of mere visual contact with elements of nature (Grinde & Grindal Patil, 2009). Likewise, there is evidence of human health consequences associated with a lack of contact with healthy nature. For example, in terms of direct effects on physical health, high levels of pollution are related to an increased prevalence of respiratory and other illnesses in both children and adults (Premaratna et al., 2002). Also, some suggest the lack of contact with nature associated with greater concentrations of people in urban settlements may be related to the increasing prevalence of mental illness (Pretty et al., 2004). Such studies that report on the negative consequences of unhealthy natural environments, or simply absence of healthy nature, provide support for the biophilia hypothesis.

Similarly, there is evidence that contact with nature is associated with a number of positive effects on health; a healthy natural environment, compared to an unhealthy one, can have beneficial effects on several aspects of personal health and well-being. In a

review of the literature, Maller and colleagues (2005) found an effect of viewing natural scenes on various aspects of health, such as stress relief, psychological or mood state, and well-being. This effect was present across several settings including hospitals, prisons, the workplace, and while driving in a car. Kaplan and Kaplan (1989) reviewed the literature and found that being in close proximity to natural settings has immediate positive health impacts, such as feelings of enjoyment and relaxation, and reductions in stress.

In addition, health benefits are also found for being in the natural environment. Many studies have suggested the idea of a restorative environment; that is, spending time in a natural setting can have positive effects on well-being (Maller, Townsend, Pryor, Brown, & St Leger, 2005). It is important to mention, as noted in a study of 3000 Finnish-speaking people, that the restorative potential of the natural environment is related to a number of determinants, including length of stay, nature orientedness, frequency of visiting the natural location, and physical activity (Korpela, Ylén, Tyrväinen, & Silvenoinen, 2008). A positive relationship has been found between access to nearby nature and levels of job, home, and general life satisfaction (Kaplan & Kaplan, 1989); longevity and levels of physical activity (Takano et al., 2002); and overall health (Stone, 2006; Takano et al.). One Dutch study found that living in a green environment was positively associated with three different measures of self-reported health, and this association was greater than with municipal urbanity. This relationship was stronger for housewives and elderly, two populations who presumably spend more time in their local environments (De Vries et al., 2003).

*The Present Lack of Engagement with Nature*

Several observations support the assertion that youth today may be less exposed to the natural environment than youth in previous generations. First, the development of the public school system, essentially beginning in the 20<sup>th</sup> century, has resulted in youth's school attendance for about a third of their waking hours (Rivkin, 1997).

Institutionalization has expanded beyond school over the years to include day care, team sports, a variety of lessons, and transportation between indoor locations, resulting in a reduction in children's time for interaction and play in the natural environment (Rivkin).

Children's access to outdoor surroundings in their neighbourhoods may be further limited by lack of available parental supervision (Rivkin). Also, increasing urbanization often results in a decrease in number and proximity of green spaces in relation to individuals' living environments (Tzoulas et al., 2007). Furthermore, aside from increasing physical distance from the natural environment, the introduction of new technologies such as television, internet access, and video games, has contributed to increased participation in sedentary indoor extracurricular activities. Based on data from the Campbell's Survey on Health and Well-being, Shields (2006) reports that screen time activities (i.e. watching television, playing video games, computer use) are common for many Canadian children. In 1988, when 12-17 year olds were asked how many hours they watched television, the weekly average was nine, which is comparable to the 2004 reported average of ten hours per week. However, when the reported hours spent in other screen time activities (playing video games and computer use) were included, adolescents' total average weekly screen time increased to 20 hours (Shields, 2006). Similarly, in a cross-sectional study of 25,060 grade 9-12 students in Ontario, students self-reported a 2.7 hour average screen time per

day, which is equivalent to approximately 19 hours a week (Leatherdale & Wong, 2008). It thus appears that younger generations are spending increasingly less time in the natural environment.

### *Adolescents and Environmental Issues*

Within the general public, it appears the majority of people are at least aware of major environmental issues, such as climate change. However, despite a typically high level of awareness and concern, many people still do not change their behaviour to curtail their contribution to environmental health problems. One American study found that, although 92% of participants self-reported awareness of climate change or global warming, about 42% of people reported not changing their behaviour to counteract climate change. The most common reasons for lack of action were not knowing how to reduce one's contribution to climate change, believing behaviour change would not make a difference, not having enough money, and not having enough time (Semenza, Hall, Wilson, Bontempo, Sailor et al., 2008).

Research into adolescents' perspectives on environmental issues indicates variability in environmental attitudes and beliefs. One questionnaire administered to students aged 13-17 years in the United Kingdom assessed self-reported opinions on environmental challenges and interpreted that the majority of participants were very optimistic about the future, but did express concern over environmental issues. However, there was response variability regarding many environmental issues, including how to respond to environmental challenges and the role participants believed they should take in addressing challenges. Further, almost half of boys (46.1%) and 36.1% of girls agreed with the statement "people worry too much about environmental problems" (Jenkins &

Pell, 2006, p.772), perhaps indicating that these youth did not believe environmental issues were a great concern.

In another study, focus groups were conducted with 16-17-year-old adolescents in two Australian cities. Results indicated that, without specific prompting, individual futures were young people's major concern, rather than the future of society or the environment. Young people's attitudes were characterized by a strong sense of ambivalence toward environmental issues (Connell et al., 1999). Despite concern for environmental problems, participants felt frustrated and angry that little practical action was being taken on a world-wide scale, personal impact seemed minimal, and there was little hope for change in the future (Connell et al.).

Similarly, a study of British secondary school students found that participants were optimistic about personal futures, but more pessimistic about community and world-wide quality of life. Participants indicated concern for environmental health, but did not know how they could individually behave to counteract the problem (Hicks & Holden, 1995; as cited in Hicks & Holden, 2007). In a later study, Holden (2007) reported that teenagers were similarly concerned about environmental issues, but were the least optimistic about solving environmental problems in comparison to the likelihood of solving other large-scale issues (e.g., poverty). However, the majority of respondents stated they were not contributing in any way to change. Studies such as these demonstrate that while youth consider environmental issues to be a concern, they typically lack a sense of agency. That is, there is a need for youth to become empowered and believe individual behaviour change will make a difference to "move beyond their initial disinterest, pessimism, or despair" (Hicks & Holden, 2007, p. 508).

Further, in an American study analyzing trends in an annual nation-wide survey of grade twelve students called the Monitoring the Future (MTF) study, researchers reported decreases in environmental concerns, belief in resource scarcity, and participation in conservation behaviours from the 1990s until 2005 (the last year of analyzed survey data) (Wray-Lake, Flanagan, & Osgood, 2010). Researchers hypothesized that the trend for decline might be attributed to a variety of factors, including changing attitudes toward government leadership, materialistic values, and changes about beliefs in resource scarcity and faith in technological advancements (Wray-Lake et al.).

With respect to environmental knowledge and behaviours, one study reported a significant linear relationship between pro-environmental attitudes and adolescents' environmental behaviours. Adolescents who demonstrated more proenvironmental attitudes and greater environmental knowledge self-reported greater amounts of proenvironmental behaviours (Meinhold & Malkus, 2005). Youth may, therefore, need to care about the environment, know how to contribute positively to change, and believe their actions will make a real difference.

#### *The Consequences of a Lack of Engagement with Nature*

While there may not be direct evidence of a causal relationship between spending less time in nature and the state of youth and environmental health (surely multiple factors contribute to health), we do know that an association exists between both time in nature and personal health, and time in nature with environmental values. Also, we know that youth and environmental health are presently both suffering. Currently, there is abundant evidence that the state of health of the environment is in jeopardy. Beyond the

commonly acknowledged global warming phenomenon, evidence shows that, over the last 50 years, there has been a significant loss in biodiversity due to the rate of anthropogenic ecosystem change (Weinstein, 2005). There are also a variety of other problems, including an increasing rate of biological extinctions (Dayton, 2003).

### *The Benefits of Physical Activity and Consequences of Inactivity*

Just as we are aware of the consequences associated with lack of contact with healthy nature, there are also well-documented consequences of physical inactivity. Correlations have been found between physical inactivity and several chronic diseases, such as cardiovascular disease, type 2 diabetes, breast and colon cancer, and osteoporosis, as well as an increase in risk for all causes of mortality (Warburton et al., 2006). Further, physical inactivity is linked to the now epidemic prevalence of overweight and obesity in both developed and developing countries (e.g., Hohepa, Schofield, & Kolt, 2004). These consequences clearly have a direct impact on physical health, but also effect mental well-being (Pretty et al., 2005).

Conversely, it is known that adequate levels of physical activity can have beneficial effects on health. While physical inactivity is associated with an increased risk for a number of chronic conditions, physical activity can reduce the likelihood of obesity (Katzmarzyk et al., 2000) and the aforementioned chronic diseases (Warburton et al., 2006). Furthermore, physical activity may improve psychological health. A literature review on the effects of physical activity on anxiety found that exercise training was associated with a reduction in anxiety symptoms in patients with panic disorder (O'Connor et al., 2000). Similarly, another literature review found that physical activity reduced depressive symptoms in laboratory studies and was associated with a reduced

risk for depression in population-based studies (O'Neal et al., 2000). This is important for adolescents considering a 49% increase in the overall prevalence of antidepressant use in American adolescents between 1998 and 2002 (Delate et al., 2004), and the potential for prescription of physical activity as treatment of depression (O'Neal et al.). Moreover, it is suggested physical activity may have protective effects on youth, preventing the development of emotional problems by increasing levels of self-esteem, body image, and self-concept (Calfas & Taylor, 1994).

### *Adolescent Physical Activity Levels*

Given the various health benefits associated with being physically active, having adolescents meet physical activity recommendations is an important step in addressing their health concerns. Recommended levels of physical activity for adults generally suggest the accumulation of at least 30 minutes of moderate physical activity daily in bouts of at least ten minutes (Warburton, Katzmarzyk, Rhodes, & Shephard, 2007) and some suggested levels for adolescents are similar (Cavill, Biddle, & Sallis, 2001). Applying these criteria, a review of the physical activity literature indicated that approximately 50% of adolescents internationally do not meet the minimum daily physical activity requirements to achieve health benefits (Stone et al., 1998).

Reported inactivity levels may be even higher when more stringent physical activity criteria are applied. In Canada specifically, the Canadian Fitness and Lifestyle Research Institute (CFLRI, 2005) reported that 73% of children and youth aged 5 to 19 do not accumulate sufficient daily steps (16,500) to meet the sex-specific criteria associated with a healthy Body Mass Index (BMI). This number of steps corresponds to 90 minutes of moderate-to-vigorous physical activity each day, in addition to the activities of daily

living (CFLRI). Furthermore, although half of Canadian teenagers reported being active during their leisure time, only 21% accumulated enough daily activity to meet the international guidelines for optimal growth and development (i.e. 6 kilocalories per kg of body weight per day) (CFLRI). These findings are particularly alarming considering that early physical activity practices may set the stage for future behaviour, and physical activity levels tend to decline with age, with a significant decrease occurring in the transition from adolescence to adulthood (Stone et al., 1998).

Moreover, recent results from analysis of cycle one of the 2007-2009 Canadian Health Measures Survey provide evidence that, since the last survey in 1981, the fitness levels of children and youth have significantly declined, particularly in strength and flexibility (Tremblay, Shields, Laviolette, Craig, Janssen et al., 2010) . Also, aerobic fitness was shown to decrease with age among both boys and girls. Furthermore, body composition (using BMI, waist circumference, and skin fold measures) increased substantially, indicating less healthy levels than in 1981, with strong evidence that the increases in BMI specifically were a result of greater adiposity rather than greater muscularity (Tremblay et al.). It is important to note that the results may be positively biased (i.e., the declines in health status may actually appear less pronounced than in reality) due to the screening criteria used during the fitness tests. That is, statistical analysis indicated that persons who were screened out of the fitness tests were heavier than those who completed them (Tremblay et al.).

A number of studies have investigated the predictors of adolescent physical activity participation. One study on Canadian adolescents analyzed the National Population Health Survey and reported physical activity increased with household

income, school attendance, and social involvement, but was inversely related to age, smoking behaviour, and concern about weight. Being female as opposed to male was also associated with lower levels of physical activity (Wharf Higgins, Gaul, Gibbons, & Van Gyn, 2003). Physical or built environment characteristics, including crime rates, school environment, and a variety of neighbourhood characteristics, such as proximity to parks, may also predict youth physical activity (Davison & Lawson, 2006).

Other studies adopting qualitative approaches provide insight into adolescents' perspectives on physical activity participation. In a study of New Zealand youth's perspectives on physical activity outside the school setting, Hohepa and colleagues (2006) found major barriers to participation were related to the physical and social environment, including lack of peer social support, and low accessibility and availability of physical activity opportunities. Further, female students reported the structure of physical education classes as a barrier. In another qualitative study with adolescent girls, the reported barriers to physical education participation were related to accessibility, lack of choice, lack of enjoyment, and lack of control (Gibbons, Wharf Higgins, Gaul, & Van Gyn, 1999). Other research found evidence for barriers fitting the ecological framework, including parent and friend social influence; environmental factors related to programming, accessibility, and facilities; and intrapersonal factors related to fun, time, and health benefits of physical activity (Humbert, Chad, Bruner, Spink, Muhajarine, et al., 2008).

Understanding the reasons for low levels of physical activity in adolescents, particularly from the perspectives of adolescents themselves, can inform strategies to improve adolescent physical activity, and consequently, overall health. As previously

mentioned, there are also a number of consequences associated with lack of contact with a healthy environment. As such, it is necessary to address both of these concerns, both for the sake of adolescent health and environmental health.

### *Physical Activity and the Natural Environment*

It is evident that increasing both physical activity and contact with the natural environment would be beneficial to adolescent health. A logical next step, then, would be to suggest engaging in physical activity in natural environment settings. Maller and colleagues (2005) suggest the following:

Collaboration with the environmental management sector and the use of public natural spaces in population health promotion is a clear potential strategy... Nature can be seen... as an under-utilized public resource in terms of human health and well-being, with the use of parks and natural areas offering a potential gold mine for population health promotion (p. 52).

In addition to the individual health benefits of spending time in nature, there is evidence of a synergistic benefit of being physically active while being exposed to nature (Krenichyn, 2006), which Pretty and colleagues (2007) have termed “green exercise”. In one study, participants viewed photos of natural scenery while exercising on a treadmill and experienced greater reductions in blood pressure, increases in self-esteem, and improvements in mood than were seen with exercise or viewing the scenes alone (Pretty et al., 2005). Another study found improvements in self-esteem and mood after participating in ten different forms of green exercise, regardless of the intensity or duration of the activity (Pretty et al., 2007). Furthermore, a number of studies (e.g. Caulkins, White, & Russell, 2006) have found positive results with troubled youth using

wilderness therapy, a method of clinical treatment that involves a prolonged period of time in the wilderness while engaging in exercise, typically backpacking. It is worth noting that it may be green natural environments, as opposed to just outdoor environments that have the greatest effects on health. In one study that compared the mental and physical effects of exercise in different settings, a small group of runners reported greater restorative effects of a park setting when compared to other outdoor settings such as city streets (Bodin & Hartig, 2003).

Furthermore, going beyond merely being physically active in nature, some studies have explored directly improving personal health by acting to improve the health of the environment. One qualitative study explored three participants' experiences with the Green Gym scheme, which had volunteers engage in physical activity by carrying out practical environmental conservation tasks. Participants reported improved fitness, enhanced mental well-being, being stimulated by nature and social contact, and feelings of making a valuable contribution (Birch, 2005). A study with members of land management conservation groups in Australia similarly found perceived benefits, with participants reporting higher self-rated health, less frequent visits to the doctor, feeling safer in their communities, and utilization of skills, than members of the control group (Moore et al., 2006).

Thus, it seems that the greatest benefits for health can be achieved when people are "engaged" with nature in an active way. According to an online dictionary ([www.dictionary.com](http://www.dictionary.com)), to engage means to "attract and hold fast; to occupy oneself; and to become involved". Also, in terms of mechanics, engage means to "cause to become interlocked; interlock with". In the context of environmentalism specifically, engagement

has been defined as meaningful involvement in environmental issues, including the presence of cognitive, affective, and behavioural components (Pancer, Rose-Krasnor, & Loiselle, 2002). Taking these definitions in combination, engagement seems to be an active process, including another party that is mutually affected by the engagement. It implies holistic absorption in something, and further, necessary interconnectedness. Just as suggested by the social ecological model and the settings-based approach, human engagement with nature thus can affect not only human health, but simultaneously, environmental health, in a state of bidirectional influence.

### *The Need for Youth Engagement*

Because youth health is a concern, and, as discussed previously, being “healthy” seems to be dependant on a number of factors, including being engaged with the people and world around us, it is important to understand youth perspective on health and their sense of bidirectional influence in their ecosystems. In one study, focus groups were conducted with 86 grade nine students during physical education class to gain a better understanding of student perspectives of what it means to be “healthy”. According to this study, grade nine students thought being healthy meant obtaining health in a number of areas, including social, physical (including having an active lifestyle and healthy eating habits); emotional, and intellectual (Beaudoin, Mathias, & Fraser, 2004). In keeping with the social ecological model, these youth acknowledged that health is a holistic concept, and implies more than merely the lack of illness. However, these youth did not mention the importance of environmental health, which suggests they did not consider the effects of the natural environment on their personal health. This may be due, in part, to the context in which they were interviewed. That is, because they were asked about health in

a school physical education setting, they were likely to interpret health within their present context.

While some youth may not consider the importance of nature in personal health status, as discussed previously, there is a great deal of evidence to support the link between engagement with nature and personal health. Furthermore, not only is their health affected by their environments, but they have the ability to affect their own health by affecting environmental health. As they enter into early adult years, today's adolescents will need to address both personal and environmental health issues. Consequently, there is a need to re-connect, or simply connect youth with the natural environment, both for the sake of youth health and environmental health. Increasing contact with nature will not only result in a number of personal health benefits, but may encourage a sense of environmental responsibility. This is important because it has been suggested that youth environmental views are relevant to eco-friendly policy development, sustainability, and the general well-being of future generations (Jenkins & Pell, 2006). Considering that early experiences with nature and the outdoors may help to develop environmental values (Chawla, 1999; Place, 2004), it seems that encouraging contact with nature may help adolescents to develop proenvironmental attitudes, and subsequently, proenvironmental behaviours.

However, because youth tend to be more concerned with individual health and futures (Connell et al., 1999), it may be necessary for them to understand the interplay between their own health and futures and the health of the environment before youth will connect with nature and value the environment and health. Consequently, based on the preceding discussion, it appears engaging youth with nature would address the two issues

at hand in combination. Doing this would effectively target the health of adolescents while engaging them with the natural environment to encourage the development of proenvironmental attitudes and behaviours.

### *Connecting Youth with Nature*

Evidence shows that youth participation in initiative development and understanding the youths' views are very important elements in the success of behaviour change strategies. Participation in decision making is a long held tenet of health promotion (Green & Kreuter, 2005). Indeed some of the most efficacious behaviour change interventions are founded on this principle. For example, social marketing, a strategy that has been demonstrated to effectively create change (e.g. Huhman, Potter, Wong, Banspach, Duke et al., 2005; Wong, Huhman, Heitzler, Asbury, Bretthauer-Mueller et al., 2004; Zucker, Hopkins, Sly, Urich, Kershaw et al., 2000), emphasizes that marketing must be based on an "understanding of the consumer's decision making and consumption system with respect to the product" (Donovan & Owen, 1994, p.284). Also, the California Wellness Guide, a comprehensive health promotion guide developed with extensive community participation, was read by 86% of recipients. Of those who read the Guide, 74% retained the information, and 26% reported modifying their behaviour as a result of reading the Guide (Neuhauser, Schwab, Syme & Bieber, 1998). In contrast, the authors compare the results of this study with typical, yet much less successful, risk-factor interventions such as the Multiple Risk Factor Intervention Trial (MRFIT), designed by experts and researchers with little consideration for their participants' needs and experiences.

Therefore, it is logical, as Cook (2008) notes, that effectiveness of programs is also likely to increase when “young people themselves are involved in designing and delivering activities intended for their benefit” (p.121). One study assessing student involvement in democratic groups in the UK reported that engagement and control of activity design and dissemination gave students the feeling they could “improve things” (94%) and endowed them with sense of independence, trustworthiness, and responsibility (98%) (Hannan, 2001; as cited in Cook, 2008). Also, Chawla (2002) reports that youth participation in the United Nations Educational, Scientific, and Cultural Organization’s (UNESCO) Growing Up in the Cities (GUIC) project resulted in increased adolescent stakeholder support as well as a greater community level understanding of adolescent strengths and abilities.

It is important to note that the mere presence of youth participation is not what matters, but rather, it is the capacity for influence associated with youth participation. As noted by Cook, Blanchet-Cohen and Hart (2004), participation is only positive when adolescents are given some power in the participation process. That is, it is necessary to provide participants with some control over the choice and implementation of the program or initiative. When this does not exist, the results may yield greater frustration and social disengagement from adults. Thus, to obtain the benefits of participation, youth and adults must be able to engage in critical conversation, with both parties holding power in the process (Cook et al.).

#### *Study Framework: Social Marketing*

The purpose of youth participation is to fairly and accurately represent youth perspective on an issue. The principles of social marketing emphasize the importance of

researching and understanding the specific needs, beliefs and attitudes of a target population with respect to a desired behaviour in order to effectively inform future policy and program development (Kotler et al., 2002). Specifically, social marketing is a behaviour change strategy that involves the “use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behaviour for the benefit of individuals, groups, or society as a whole” (Kotler et al., p. 5). While sharing aspects of some other behaviour change approaches, such as education, persuasion, behaviour modification, and social influence, social marketing both differs from and builds on these other strategies. A summary of the defining characteristics of social marketing is shown in Table 1 and discussed below.

Table 1

*Seven Defining Characteristics of the Social Marketing Approach*

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1. Consumer behaviour is the bottom line
  2. Programs must be cost-effective
  3. All strategies begin with the customer
  4. Interventions involve the 4 P’s: product, price, place, and promotion
  5. Market research is essential to developing, pretesting, and evaluating interventions
  6. Markets are carefully segmented
  7. Competition is always recognized
- 

*Note:* From “Marketing social change” by A. Andreasen, 1995, Jossey-Bass, p. 14.

In addition to a consumer orientation framing the social marketing paradigm, there are other social marketing concepts that are particularly useful for the purposes of this study, including the four Ps of the ‘marketing mix’ (product, price, place, and promotion), and the idea of competition. Product refers to “the set of benefits associated

with the desired behaviour” (Grier & Bryant, 2005, p.323). A subset of the product, which Kotler and colleagues (2002) refer to as the core product, is the benefits the target audience associates with the behaviour and considers important or most valuable. This helps determine how those who wish to influence the target audience’s behaviour should frame the product (i.e., for this study, engaging with the environment) in order to make the behaviour change most desirable. Price is the “cost or sacrifice exchanged for the promised benefits” (Grier & Bryant, p.323) as they are seen from the target audience’s point of view. This can include both monetary costs, and nonmonetary costs, such as costs related to time commitment, effort, or psychological discomfort (Kotler et al.). Place is “where and when the target market will perform the desired behaviour, acquire any related tangible objects, and receive associated services” (Kotler et al., p.243). It was expected place would be particularly influential in this study due to the powerful effects the natural environment context can have on attitude and behaviour (Carpiano, 2009) and the role of ‘place’ (i.e. environmental setting) in health (Dennis, Gauchoer, Carpiano, & Brown, 2009). Finally, promotion is a form of communication of the “product benefits and associated tangible objects, services, pricing strategies and place components” (Grier & Bryant, p.324). Competition refers to behavioural options that compete with the desired behaviour, environmental engagement (Grier & Bryant). It is important to understand the competing behaviours when designing the pricing strategy (Kotler et al.).

Because the language used in social marketing reflects its roots in a commercial marketing orientation, it is often seen as distasteful to those not entirely familiar with the rich tradition of social marketing (Maibach, 2002). However, the shared phrasing is not to be confused with a shared bottom line. At its core is participant-centered change.

The social marketing process typically involves the creation of a marketing plan, which occurs in a number of stages. An initial situational analysis involves identifying the social issue the campaign is addressing, evaluating relevant research, selecting a campaign focus, and deciding on the purpose and intended impacts of the campaign. The second step involves identifying campaign objectives, and information and beliefs that will increase the likelihood of engaging the audience in the desired behaviour (Kotler et al., 2002). The best target group- that is, the group where efforts will have the greatest impact- is then selected based on identification of groups that share common demographic and psychographic characteristics and subsequent prioritization of these groups. The basis for selection of youth as the priority audience for this proposal is described in chapter three (p. 40).

A social marketing framework has been applied to create desired behaviour change with youth in several contexts, though two campaigns have been particularly successful. The VERB social marketing campaign, funded by the United States Centers for Disease Control and Prevention (CDC), was the first national and multicultural media campaign to target physical inactivity in “tweens”, or youth aged nine to thirteen (Wong et al., 2004). The VERB campaign utilized extensive formative research through focus groups, interviews, and ethnographic inquiries, in order to understand tweens’ perspectives on physical activity. Based on survey data collected after one year of campaign implementation, the researchers discovered high levels of awareness (74% of total sample) and understanding of the VERB campaign, and also an increase in free-time physical activity sessions in the population (Huhman et al., 2005). Data collected after two years of implementation showed that awareness of the VERB campaign (totalling

81% of children 9-13 years old nation-wide) and frequency of exposure were significantly positively related to an increase in cognitive and behavioural physical activity outcomes. Also, the campaign effects were significantly stronger than after year one (Huhman, Potter, Duke, Judkins, Heitzler et al., 2007).

Another social marketing campaign directed at youth that showed a high level of success was Florida's "truth" anti-smoking campaign, implemented in March, 1998. This campaign utilized youth-driven advertising and strategies, set in a wide-variety of media, merchandising and youth-focused events, and was based on empowering teens to combat the manipulative strategies used by the tobacco industry (Zucker et al., 2000). According to telephone surveys, by September 1998 "truth" had achieved 92 percent brand awareness among youth in Florida. Furthermore, there was a 19.4 percent decrease in rate of smoking in middle school students, and an 8.0 percent decrease in the high school student rate (Zucker et al.).

Social marketing is in keeping with holistic models of health (social ecological, settings-based) with its emphasis on a participant orientation, proposing a "people and places framework" that identifies people- and place- based factors that act to influence human environments. It reveals the choices, chances, and circumstances shaping behaviour. With its endorsement of understanding and involving the target audience in the behaviour change process, social marketing has been suggested to fit well with the aforementioned social ecological theory, as both emphasize the importance of people and places (Lyon Daniel, Bernhardt, and Eroğlu, 2009). Place-based factors manifest at the local level and the distal level, either directly influencing population health and environmental outcomes, or indirectly causing or preventing certain environmental

outcomes through human actions (Maibach, Roser-Renouf & Leiserowitz, 2008). As described by Maibach and colleagues:

The potential of communication and social marketing as means to influence population health and environmental outcomes becomes clear in the context of this framework. Specifically, most of the people- and place- based drivers of population behaviour potentially can be influenced through communication and/or social marketing (p. 490).

*Exploring the Target Audience's Perspective with Photovoice*

Research methods that engage the community and guide research toward social action are fruitful ways to generate research benefits for a non-research audience, a principle that is in keeping with the social marketing aim to initiate change for the benefit of the target audience. One innovative qualitative research method, known as Photovoice, offers a potential method for creatively representing the perspectives of persons outside the academic and policy communities, while contributing to positive social change.

Wang and Burris (1997) describe this method as follows:

Photovoice is a process by which people can identify, represent, and enhance their community through a specific photographic technique. It entrusts cameras to the hands of people to enable them to act as recorders, and potential catalysts for change in their own communities. It uses the immediacy of the visual image to furnish evidence and to promote an effective, participatory means of sharing expertise and knowledge (p. 369).

The process is highly adaptive depending on specific participatory goals, different groups and community, and distinct public health issues (Wang & Burris, 1997). For

instance, researchers have utilized Photovoice with a variety of underserved or marginalized populations, including at-risk youth (Wilson, Dasho, Martin, Wallerstein, Wang, et al., 2007). Wilson and colleagues describe the application of Photovoice in the Youth Empowerment Strategies (YES!) project. The purpose of the program was to enhance community capacity for prevention of numerous health conditions and to engage youth as critical thinkers and problem solvers to inspire social action. In the YES! program, participants selected their issue for social action in groups and then used the Photovoice process to attempt to change the issue of interest. One group of students addressed the issue of littering by organizing a school-wide cleanup campaign, inviting other students to help clean litter off the playground. They used photography to display the playground before and after cleanup, then made presentations in classrooms and circulated a petition to stop littering (Wilson et al.).

In addition, others have demonstrated its utility with more mainstream populations (Goodhart, Hsu, Baek, Coleman, Maresca, et al., 2006). Goodhart et al. applied Photovoice with university students, explaining that this group may feel poorly equipped to access or influence those who make decisions affecting their lives. Photovoice was seen as valuable because it empowers students to become more aware of their environments, and to understand issues from different points of view. Further, it provided a process and resources for students to amplify their voices in order to influence and gain power to shape the university policies. Students in this university course setting used Photovoice to identify a number of campus health issues including, marijuana availability and use, tobacco sales and signage, drinking behaviour and advertising, nutritional food availability and quality, and insufficient sexual health information or

condoms. Furthermore, they presented their projects to stakeholders and policy-makers on campus in order to enact change. Other researchers have not only utilized Photovoice methodology to explore youth perspectives on health, but also applied social marketing strategies to make the Photovoice projects most effective. In one project, youth demonstrated their perspectives on pertinent health issues by creating posters. Participants applied social marketing strategies to their visual images and phrases, such as audience segmentation and product placement, to most effectively encourage behaviour change among peers (Necheles et al., 2007).

Visual images can serve as a powerful method of representation, where the audience may feel an emotional connection, interpret the photos and stories of others as relevant to their lives, and possibly modify or simply become aware of their own perspectives in the process. Photography may supersede language in terms of communication. Sometimes, we cannot find the words to express exactly what we mean to portray. Pictures, however, may convey a sense of feeling that is otherwise lost in translation. Furthermore, because the natural environment can have such powerful effects on human health and well-being even in pictorial form (e.g., Pretty et al. 2004), photos of settings, representing engagement with nature and associated health effects may serve as an untapped, yet influential, method of communication and stimulus for action in environmental and personal health research.

Freire's (1970) literature on critical consciousness addresses the potential for learning that has served partly as the basis for Photovoice methodology. In a study exploring the potential of Photovoice in teaching about diversity in the classroom setting, Chio and Fandt (2007) reported that the inherent processes of reflection, discussion, and

representation resulted in acquisition of a heightened “consciousness of self”. For instance, in a group that selected to address environmental issues, one student reflected on an occasion where she had negatively engaged with nature by defacing it. Upon reflection, she began to question her beliefs surrounding her relationship with nature and noted her apparent “dominant” approach to nature. Another student who represented environmental pollution in her photography considered why this was important to her, and what the pictures said about human-nature relations (Chio & Fandt). As such, Photovoice may be a method to simultaneously conscientize youth to their community’s issues and assets, empower youth to make change in their own lives, and act as a method to effectively demonstrate youth perspective to policy makers in order to best effect desired change.

In addition to using Photovoice methodology, this study proposed the use of Web 2.0 as part of the data collection methods to address the interests and abilities of the current generation of students. Web 2.0 is the term used to describe the second generation of digital technologies used to enhance creativity, information sharing and networking. According to O’Reilly (2005), there are four levels of Web 2.0 use, from the most basic (e.g., map quest) to the more sophisticated social networking (e.g., blogs, wikis, podcasts, flickr). In keeping with the constructivist perspective, the pedagogy of this technology is that its learner-centered principles support active knowledge construction and enrich the learning experience (Ulrich, Boarau, Luo, Tan, Shen et al., 2008). Specifically, this study invited participants to use the popular social networking website, Facebook, in order to aid in collection of data and enhancement of data trustworthiness through a member check in. Unfortunately, none of the participants in this study joined the project specific

Facebook discussion group, perhaps due to limited internet access (i.e., only access through school computers which do not allow students to use Facebook) or the time associated with creating a new Facebook account with a pseudonym (which was required in order to protect anonymity).

### *Study Purpose*

There is an abundance of literature supporting the positive health effects of engaging with nature. Furthermore, there is a surge in present political agendas to address the issue of youth health and engagement with nature. However, youth perspective on benefits, beliefs, and barriers to engaging with nature is not well understood. A number of studies have indicated the necessity of understanding the perspective of this population when developing programs (Hohepa et al., 2006). Further, beyond simply listening to the community perspective, researchers in the health promotion field are increasingly emphasizing the need for community involvement throughout the program development and implementation process in order to achieve the greatest levels of acceptance and success. Studies that involve adolescents in program development report increased participation and an increased sense of project ownership among participants (Skinner et al., 1997). Whereas some traditional research methodologies may lack the ability to excite and engage youth in health promoting activities, there is evidence to support that Photovoice is an effective strategy for actively engaging youth in exploration and expression of their own health issues (Necheles et al., 2007).

Photovoice represents youth perspective rather than relying on what decision makers assume are youths' problems and corresponding solutions (Chio & Fandt, 2007), and also involves participants in the process of social action. Thus, in terms of social

marketing, it is an appropriate methodology to gain an understanding of the consumers' perspectives with respect to the four Ps: product, price, place, and promotion. Furthermore, because this methodology allows for small group discussion and requires critical reflection and dialogue (Wang & Burris, 1997), it provides an excellent opportunity for environmental and health education by encouraging greater "consciousness of self" and awareness of differences in the perspectives of others (Chio & Fandt). Similarly, it promotes the pedagogical process of conscientization, or the understanding that humans live in existence 'with' the world rather than simply 'in' the world (Freire, 1970). That is, rather than simply experiencing contact with the world, they have the capacity to realize that their actions inseparably transform the world around them, and they are, in fact, inter-related (Freire). Dialogic pedagogy, as opposed to a coercive or paternalistic style of teaching, is seen as the basis of liberation and social change via the process of conscientization. A dialogic classroom setting facilitates critical thought through the introduction of a variety of perspectives and the use of mutual respect and shared discussion (Freire, 1993; Freire & Macedo, 1995). The process of conscientization clearly has relevance for this study in its ability to promote environmental values through understanding the inextricable link between human health and the health of the natural world, and its ability to encourage liberation through the use of experiential education.

Therefore the purposes of this study were threefold: 1.) to understand youth perspectives on engaging with the natural environment through physical activity and the effects on health; 2.) to use discussion and Photovoice projects as a tool for conscientization/health education/awareness; and 3.) to use these ideas to present to

policy makers to initiate action. The following chapter details the research methodology used to address these purposes.

## CHAPTER THREE

### Methods

This case study, where the “researcher strives for an in-depth understanding of a single situation or phenomenon” (Thomas, Nelson, & Silverman, 2005, p.290), was conducted to gain a thorough understanding of one group of youth who are already concerned with environmental issues. Chapter three has been divided into the following sections: descriptions of Photovoice methodology, participants and recruitment, data collection methods, ethics information, evidence of data quality and data analysis. The data collection methods are further sectioned as: participant demographics and physical activity information, Photovoice projects, and school board presentation.

The first phase of data collection involved having the participants complete brief demographic and physical activity questionnaires, followed by individual Photovoice projects. Once the projects were completed, participants were asked to join a project-specific Facebook group to post their photos and to view and comment on others’ photos. Alternatively, if participants did not wish to join the Facebook group, they were instructed to send me three to six pictures of their choosing prior to an in-person discussion group where the projects were discussed in greater detail. As stated previously, all participants chose not to join the Facebook discussion forum and instead opted to send me their chosen photos prior to the discussion group. Following the in-person discussion group, three of the participants presented the Photovoice projects to their local school board officials. The presentation preparation session was also used for member check in. That is, I orally presented preliminary analyzed data to receive the participants’ feedback on my interpretations.

### *Photovoice Methodology*

Photovoice methodology has three main goals. First, it enables people to record and reflect on the assets and issues that exist in their own communities. Second, through discussion of photographs, critical dialogue and knowledge generation of community issues are promoted. Finally, the process may successfully reach and influence policy and decision makers (Wang, 2003; Wang & Burris, 1997).

The theoretical underpinnings of Photovoice are derived from: the education literature on critical consciousness, feminist theory, and a community-based participatory approach to documentary photography (Wang, 2003; Wang & Burris, 1997). The critical consciousness literature is based on the work of Freire (e.g., 1970; 1993), who suggested that visual images are a way to encourage people to think critically about their own communities. Critical consciousness or problem-posing education has people examine issues seen as important to their lives and engage in dialogue to generate common themes. Also, ideas drawn from feminist theory counter the male bias that can exist in participatory research to empower women and other marginalized populations in the research process (Wang & Burris). In addition, Photovoice expands on documentary photography. It tells individuals' stories, but rather than treating participants as passive subjects in the documentary process, photography is used as a tool to represent their own perspectives, advocate for their own well-being and catalyze change in their communities (Wang; Wang & Burris). Through this interactive and action-oriented process, Photovoice can empower individuals to change their own truths.

Because of its adaptability to various populations and contexts, Photovoice was chosen as an appropriate method to explore adolescents' perspectives on environmental

engagement and health. In addition to expressing the perspective of non-experts (adolescents) to the experts (decision makers) and catalyzing change, it provides the opportunity for individuals to experience change in attitudes, beliefs or behaviours as a result of conscientization. Conscientization refers to a liberating process where we not only reflect on our lives in the world and question our relationships to it, but further, understand that we transform it through our actions (Freire, 1970; Freire, 1993).

### *Participants*

Because a Photovoice discussion group has similar dynamics to a focus group, the appropriate number of participants was selected based on focus group parameters. Focus groups are group interviews that are structured to foster discussion among a group of people around a topic of interest and they typically include seven to ten participants (Bogdan & Biklen, 2003). The goal for recruitment was eight to ten adolescents, aged 15-19. As is common with qualitative research, sampling was purposive and theory driven (Miles & Huberman, 1984). This study utilized a purposive criterion sampling strategy, where “cases that meet some predetermined criterion of importance” are reviewed and studied (Patton, 2002, p. 238). Participants were targeted based primarily on two social marketing principles: reachability (the participants are easy to identify and communicate with), and readiness for action (participants are ready, willing, and able to respond) (Kotler et al., 2002). That is, participants were recruited based on personal interest in the study purposes and procedures, and willingness to participate in the social action process. The age of eligible participants was determined based on the need to engage young people in environmental issues as early as possible (Chawla, 1999) and to address

complex mental and physical health issues that exist in this age group. In addition, youth in this age range are typically mature enough to act without parent intervention.

Participant recruitment was done through an invitation letter (Appendix A) passed to eligible participants (i.e. youth with environmental interests) by members of a local conference steering committee and leaders of affiliated youth environmental organizations. The steering committee was responsible for organizing a local conference on the topic of connecting children and families with nature and agreed to help recruit participants for this study. Recruitment information, including a short description of the study and my contact information, was posted on the website, in addition to a link to view the study letter of invitation if individuals wanted to read more about the study. I was contacted by a teacher to indicate he was interested in having his class of twelve students participate and he was subsequently emailed copies of the letter of invitation and the informed consent form for students to review.

Students were not obligated to participate in the study. They were asked to volunteer and there were no consequences to their class grades if they decided not to participate. Students were free to withdraw at any point during the study and could participate in as few or as many of the associated project activities as they chose, including: the Photovoice project, the Facebook discussion forum, and the final presentation. Because the class size was close to typical focus group parameters, all twelve students were invited to participate. One student returned a consent form and submitted some photos, but did not attend the orientation, discussion group, or presentation. However, these photos could not be used in the data without the participant's explanation of their meaning. Another student returned a consent form and

attended the orientation and discussion sessions, but did not complete the Photovoice project. This student's contributions to each of the discussion sessions were included. Finally, two students did not return consent forms nor did they participate in any aspects of the sessions or the Photovoice project. In total, eight students completed the entire project. Informed consent was also obtained from the class teacher, who took part in all components of the Photovoice project, as well as provided information on the course and feedback on the project's functioning.

### *Course Description*

The study participants were all enrolled in an outdoor education program, which focused on leadership and outdoor adventure, and was a part of the provincial public education system. Students from the local school district and from across the province have the option of enrolling in the semester-long program in order to earn credits in Adventure Tourism 11 or 12, Work Experience 11 or 12, Physical Education 11 or 12, and Leadership Studies 11 or 12. Theoretical learning took place in the traditional classroom setting, and practical learning, which composed about two thirds of the class time, occurred outdoors. Central to the course curriculum was the Outdoor Leadership Skills Course component, which contained six modules: trip planning and preparation, leadership studies, safety and risk management, map and compass use fundamentals, outdoor group living skills, and environmental studies. In addition, the Leadership Studies component contained modules in: communication, managerial skills, teamwork and group dynamics, self awareness and wellness, human relations, leadership in focus, and applied leadership in focus. Furthermore, the program offered a number of certifications to students, including: outdoor leadership skills, Wilderness First Aid, Flat

Water and Level 1 Sea Kayak certificates, and toastmasters, among others. In the final month of the course, students were able to apply the skills they had obtained throughout their course work by planning and implementing camps for grade seven students in the school district. Students were also encouraged to apply course values outside the classroom. For example, the program was aiming to support environmental values by being carbon-neutral and therefore encouraged students to ride their bikes to class or car-pool on field days when cycling was not an option. Students were evaluated through projects and assignments; tests and quizzes; and attendance and participation.

#### *Data Collection*

Data for this study were collected using a number of methods. The primary method of data collection was the Photovoice project, including the photos, captions, and orientation and discussion group audio recordings. Further data were gathered through the presentation preparation session comments and demographic information forms, International Physical Activity Questionnaires (IPAQ) (short form), the presentation given to the school board, and member checking. Information gathered for the case description in the previous section was derived from communication with the teacher (about course content, operation, etc), course information handouts, and the program website.

#### *Participant Demographics and Physical Activity*

Information about participant demographics and rationale for enrolling in the elective sustainability and eco-education program were collected during the orientation session using a brief questionnaire. Information on physical activity levels was gathered

using the self-administered IPAQ short form which has been deemed to be reliable and valid for use in adults between 15 and 69 years of age (IPAQ, 2005). It assesses three specific types of activity: walking, moderate-intensity activities (e.g., carrying light loads, bicycling at a regular pace, or doubles tennis), and vigorous-intensity activities (e.g., heavy lifting, digging, aerobics, or fast bicycling). The volume of reported physical activity is calculated using the amount of energy required for each activity, as measured in METs, which results in a score in MET-minutes. METs are “multiples of the resting metabolic rate and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person” (IPAQ). A total score of MET-minutes per week can also be calculated to classify a person in one of three categorical levels of physical activity: low, moderate, or high. The ‘high’ category includes persons with a total physical activity score of at least 3000 MET-minutes per week, whereas the ‘moderate’ classification necessitates a score of least 600 MET-minutes per week. The ‘low’ category is simply defined as not meeting the requirements for classification for either of the ‘moderate’ or ‘high’ categories (IPAQ). The participants’ physical activity information, as well as demographics and rationale for program enrolment are described in the results section.

### *Photovoice Project*

There are a number of steps in the Photovoice process, which are outlined by Wilson and colleagues (2007). First, the community participates in a problem definition stage, where the problem is first conceptualized, and then themes for taking pictures and broader project goals are developed. Second, before participants begin to carry out their Photovoice projects, they are trained in necessary camera techniques, ways of viewing

photographs, ethical issues surrounding photography, and strategies of dissemination that may contribute to community well-being. The third phase involves the representation and development of the community members' stories, which includes: taking pictures, discussion facilitation, engagement in critical reflection and dialogue, and the selection of the most appropriate pictures for group discussion (based on personal evaluation of significance and quality), which are subsequently contextualized through storytelling and codified to identify emergent themes, issues and theories. In the final steps, the community and researchers move toward generating social action. This involves recruiting policymakers as an audience for presentation, preparation of photos and captions for presentation, and disseminating findings to policy makers, donors, media, researchers and other parties who may be mobilized to create change (Wilson et al.).

### *Step 1: Piloting*

The Photovoice project prompts were piloted with a sample of youth not participating in the study to ensure comprehensibility (Thomas et al., 2005). Piloting was done with three 18-year-olds with whom I was acquainted. The first two question prompts were well understood and so were not modified for the study. There was some confusion with the third prompt, so I adjusted the language using the pilot group's feedback.

### *Step 2: Orientation Session*

Participants were invited to an orientation session explaining the project background, procedures, and timeline. Because participant recruitment was done through the class teacher, I did not have contact with the participants prior to the orientation

session. Upon approving the study, the teacher was sent copies of the letter of invitation (Appendix A) and the informed consent form (Appendix C), which were subsequently distributed to the students to read. Students who were interested in participating were invited to complete the consent form and bring it to the orientation session if they chose to proceed with the project based on this information.

During the orientation session, the participants and I were situated in a circle to create an atmosphere conducive to discussion. The session was audio recorded with the permission of the participants. The first portion of the orientation session involved introductions. I introduced myself, my thesis project, and education and work history relevant to the thesis project (at the teacher's request as a demonstration of the paths people in the outdoor recreation/environment field might take). Also, the study purposes were explained. Next, consent forms were collected and I reviewed the meanings of confidentiality and anonymity to ensure participants understood the concept of informed consent. Students then went around the circle and introduced themselves using their course nature-related names. Students (and the teacher) in the program adopt nature-related names of their choosing for use in the program. These were used as pseudonyms during the audio-recorded orientation and during subsequent sessions. During their introductions, students also explained their reasons for enrolling in this program. After introductions were complete, I handed out the IPAQ short form questionnaire (Appendix D) and a form to collect participant demographic information (i.e. pseudonym, age, grade, sex, hometown, and why they took the outdoors course).

Following student introductions, I explained the basic principles, purposes, and main goals of Photovoice methodology to the students. Examples of previous Photovoice

projects were shown via PowerPoint slides (e.g., Wang & Burris, 1997; Wilson et al., 2007), including some of the pictures and captions that participants had created in these studies.

Subsequently, the group discussed their reasons for participating in the project and their individual and collective project goals. The students came to a consensus that one of the group goals was to present their projects to the district school board, a group which was identified by the students as a desirable audience. Also, a brainstorming session was held around the project question prompts. Although the project issue was generated by my interests rather than by the community of participants, interpretation of the issue was derived from individual participants and interactions between participants as they discussed the question prompts, the Photovoice projects and captions, and the discussion group questions. During the orientation session specifically, participants brainstormed the meanings of terms used in the question prompts, including: what it means to be physically active, what it means to be involved or engaged with nature, what it means to be healthy, and what it means to have a healthy environment. The purpose of this exercise was to ensure that the participants had a similar understanding of the project questions. I documented the ideas generated in the brainstorming session and disseminated them to the students following the session so that they would have a point of reference for the terms while they were completing their projects.

After a short break, students were given a set of instructions describing the next steps to take in the Photovoice projects (Appendix F). These were explained orally in detail to the group. Participants were asked to take at least ten pictures at any convenient time, including during class outings, using their digital cameras. While taking pictures,

they were instructed to think about ideas that were discussed at the orientation session and consider these question prompts:

- 1.) How do you and your peers engage with nature through physical activity?
- 2.) How does this affect your health and the health of the environment?
- 3.) What youth oriented strategies best support improving the health of your peers and the planet?

Following the project description, I reviewed some basic camera techniques and use of digital cameras. Digital cameras were chosen rather than disposables for two main reasons: cost and ease of presentation using PowerPoint slides. Of the nine student participants who completed the picture-taking portion of the Photovoice study, four indicated prior to the orientation session that they had access to, and would like to use, their own digital cameras. I provided digital cameras for the remaining five students who did not have access to their own. Camera use was explained individually to ensure that each student was comfortable operating their borrowed cameras. In addition, I explained basic photography ethics around privacy, safety, and ownership of photos, and handed out copies of the photo release form (Appendix E). Participants were informed that if they chose to take photos of identifiable subjects (who had not consented to participate in the Photovoice project) then the photo subject must sign a consent form to release their image.

Finally, participants were told that once they felt that they had taken enough pictures, they should select three to six that they believed were the ‘best’ which were to be used at the next discussion session. In order to share their photos, participants were invited to sign up for a Facebook account using a pseudonym and to join a researcher-

mediated Facebook group designated to project-related discussion, questions, issues and feedback. Facebook is a social utility website where members sign on using personal profiles and connect with friends through messaging and group networks ([www.facebook.com](http://www.facebook.com)). Discussion forums have been reported by adolescents as a popular and acceptable place to discuss health related issues (Skinner et al., 1997) and according to the social marketing framework, the target population is most easily reached in locations they find convenient and accessible (Kotler et al., 2002). The Facebook group was therefore believed to be an effective mode of communication for these youth to discuss health and environmental engagement. However, none of the participants opted to create Facebook accounts, nor join the project-related Facebook group. This may have been because this was not a popular method of communication for this particular group of youth, as many indicated they either did not have regular internet access or did not regularly use Facebook. Therefore, the extra work in setting up an account may have been unwelcome rather than being seen as convenient and appealing. Instead, some participants opted to email the pictures to me, which was suggested as an alternative in the instructions, or wait until the discussion meeting to bring me their pictures.

### *Step 3: Discussion Session*

Once all participants had completed their projects, an in-person discussion lasting approximately three hours was held and digitally recorded. Group discussion, as in focus groups, is an ideal method of data collection for this study because it allows insight into the feelings, attitudes, and perceptions of participants on the topic of interest and provides a more natural environment for participants than individual interviews (Locke, Spirduso, & Silverman, 2007). The discussion session was held six weeks following the orientation.

While Wang (1999) suggests that one week is typically a sufficient amount of time for participants to complete their Photovoice projects before beginning the discussion phase, it was necessary in this instance to accommodate the course schedule (i.e. spring break, class out-trips, other planned curriculum). Also, the teacher requested to have the discussion session following a class kayak trip where he felt the students would have the opportunity to take some great pictures for their projects which led to scheduling the follow-up at a later date. As previously mentioned, some students sent their chosen photos to me by email prior to the discussion session. These photos were put on PowerPoint slides so that they could be viewed by the whole group while they were being explained and discussed. The remaining participants brought their photos to the discussion session either on their digital cameras or on a storage device and I uploaded these onto my computer and added them to the PowerPoint slides prior to commencing group discussion.

Once all of the photos had been gathered, the first part of the discussion was geared towards reviewing what had occurred in the orientation session. That is, I reminded the students of the prompts and previous brainstorming session. Next, I began asking each of the question prompts in order to generate group discussion. After a group discussion about the study questions, students were asked to choose their best photo and to write a caption explaining what they were trying to capture. Based on the suggestions for creating photo captions in Photovoice projects proposed by Wilson and colleagues (2007), participants were instructed to consider the following questions when writing captions:

- 1.) What were you looking to illustrate when you took the picture?

- 2.) What is happening in this situation?
- 3.) What do you want people to know about this situation?
- 4.) What does this have to do with health or the environment?
- 5.) What circumstances have created this situation? Why does this happen?
- 6.) What can be done about this situation? Who has the power to do something?

Although some participants were successful in writing captions following the previous format, others had difficulty expressing what they wanted to say in writing and therefore did not produce full written captions. However, following the time allotted for writing, I displayed the students' selected photos in a slide show. As each student's picture(s) was shown, they were asked to orally explain what they were trying to capture in the picture. I probed for further explanation when descriptions were brief. Group members were also encouraged to comment on each others' photos and engage in discussion about topics that arose from photo presentations. I ended the discussion by asking questions specifically designed to explore social marketing concepts related to understanding the consumer perspective (e.g. barriers, facilitators, competition). A complete list of the discussion group questions can be found in Appendix B.

Finally, I reiterated the idea of presenting the project findings at a school-board meeting (which had been scheduled for the following week) to ensure participants were still interested in this aspect of the project. The group indicated that this was important for them and nominated three members of the class to give the presentation. They discussed the logistics of the presentation (how to operate the slideshow, how many pictures to address specifically), and discussed some ideas for content.

*Step 4: School-Board Presentation & Preparation Session*

The purpose of the presentation component of Photovoice is to provide the audience, in this case the school-board members, with a youth perspective on being physically active in nature and thus fulfill the action-related purpose of Photovoice (Wang & Burris, 1997). The youth believed presenting to the school board members would allow them to demonstrate the value of their program and the activities they were participating in to people who were important to the program implementation.

Earlier in the day, prior to the school board meeting, I met with the project participants for about two hours to develop a presentation plan. The three students who were presenting settled on their topics of discussion, the picture(s) they would address during their portion, and the content of their presentations. They also set the order of picture presentation in the slide show and determined when and how frequently to change the pictures. Once everything was prepared, we ran through the entire presentation with their teacher and the other participants as an audience. Everyone provided feedback on any changes that were necessary and the presenters were given time to practice their sections at the end of the day before leaving for the school board presentation. The school board presentation was given at a previously scheduled meeting and was held in after school hours, with the superintendent, school board members, and the course teacher in attendance. The details of the information presented are discussed more in depth in the results and discussion chapters.

In addition to the presentation materials used at the school board meeting, I took note of any questions or comments from the attendees. Finally, when the presentation and question session were finished and the students and I had left the building, I asked the

presenters about their perceptions of the presentation impact, if the experience was positive/empowering, and if there was anything they would do differently in the future. Because the answers given in this context were very brief, the same questions were emailed to the presenters to request written responses later the same day. However, none of the participants subsequently responded in writing.

### *Ethics*

Ethical approval for this study was obtained from the Ethics Review Board at the University of Victoria. Participants were informed of the provisions taken to safeguard privacy and anonymity (Thomas et al., 2005), and were informed of the limits to anonymity inherent in the discussion group and school board presentation settings. All discussion group notes and audio recordings, participant consent forms, and information to track participant identification were locked and stored in a filing cabinet at the University of Victoria.

### *Data Quality*

Trustworthiness describes the overall quality of the results of a qualitative study and is considered present when the “data collected generally are applicable, consistent, and neutral” (Thomas et al., 2005, p.357). Several techniques were used in this study to provide evidence of trustworthiness. First, the study used triangulation of data collection methods, which means that three methods (Photovoice projects, presentation field notes, and group discussion transcripts) were used to collect data. Second, three sources of data are included; that is, general feedback obtained from the school board meeting attendees was considered, in addition to the perspectives of adolescent participants and the course

teacher. Third, a rich description of the setting and context was included previously and, fourth, I debriefed the findings of the study with my research supervisor who has expertise in qualitative methods and data analysis. Finally, I conducted a member check to ensure accuracy of my interpretations of data and conclusions. A member check occurs when the researcher shares interpreted data with the participants so that they may review, clarify, and add anything that may be missing (Thomas et al.). In this study, the member check was done in two ways: by presenting preliminary themes to the students during the meeting preceding the school board presentation and requesting feedback or agreement; and emailing the teacher the themes after further data analysis to request feedback.

### *Data Analysis*

First, all audio-recorded data from the orientation and discussion sessions were transcribed. This occurred immediately following each respective session. The orientation session data were distributed in note form to the participants and to the teacher as a reminder of how the class had defined several of the Photovoice project terms. For the discussion session, the accuracy of the data transcription was confirmed by having a research assistant take notes during the session. These notes were subsequently compared with the discussion transcript to ensure that comments were attached to the correct participant and to fill in any gaps where the recording was inaudible.

Analysis began after the discussion session was transcribed, when I read through the transcript to begin to identify any preliminary categories that appeared. According to Miles and Huberman (1994), early analysis “helps the field-worker cycle back and forth between thinking about the existing data and generating strategies for collecting new...data” (p. 50). Upon reading, data were dissected, notes were made in the margin,

commonalities were noted, and connections were made between participant comments to create codes. Codes are “tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study” (Miles & Huberman, p. 56). This initial analytical process drew on social marketing concepts as an orientational framework for making sense of the data (Patton, 1990). Using an editing analysis approach (Crabtree & Miller, 1992), concepts related to social marketing were identified. Using social marketing as a theoretical orientation, analysis of data is initially done at the individual level in order to elucidate each youth’s perspective on their experiences (understanding the consumer perspective). Because social marketing also draws on the concept of segmentation, these individual experiences were then grouped and interpreted as a collective.

It is an axiom in marketing, according to Lovelock and Weinberg (1989), that a product offering will not meet its full potential unless it is appropriately priced, its availability is convenient and accessible, and the information promoting its attributes and availability is effectively communicated. Facilitating physical activity in nature among youth requires that decisions be made in four broad areas known as the “marketing mix” as well as a fifth area, the public/purchaser, which is a concept encompassing a number of other characteristics necessary for audience segmentation:

- 1.) The Product and its Competition: Perceptions of engaging in physical activity in nature and its attributes or characteristics, as well as those of alternative behaviours or opportunities. The *product* is to be further conceptualized as *core* (the values attributed to physical activity and the environment), *tangible* (the actual physical activities that youth may engage in), and *augmented* (incentives or extras) offerings.

2.) The Price: The perceived benefits and costs associated with participating in physical activity and engaging with nature. Costs can be further delineated as entry (what one must give up, e.g., getting up earlier to exercise; using a car less frequently in order to walk through nature), and exit (what one must give up in abandoning an old behaviour, e.g., relaxation of watching television).

3.) The Place: Where the opportunities to be physically active in natural settings occur (types of distribution channels), and the related affordability, accessibility, convenience and comfort that youth attribute to these places or distribution channels.

4.) Promotion: The communication channels (e.g., radio, print), materials (e.g., brochures, water bottles), apertures, and design (e.g., visual, audio, slang) used to inform and persuade youth to be physically active and engage with nature.

5.) Public/purchaser: The audience's needs, including the benefits sought, barriers encountered, and variables influencing their decision to be active in nature are unlikely to be uniform for everyone. Segmentation enables physical activity and environmental health promoters to identify and define different groups and then organize a differentiation strategy matching the appropriate environmental engagement opportunities to each sub-market of youth.

The first portion of data analysis occurred in the week between the discussion and presentation sessions, and the basic themes I had identified were orally presented to the participants during the presentation preparation session. Participants were asked to provide feedback on my analysis, and were also invited to review copies of the discussion transcript to ensure accuracy. This process was a form of member checking. Following the school board presentation, notes from the session were typed up and all of the data

collected, including photos, captions, audio recordings of the orientation and discussion groups, and school board presentation observation notes were reread for analysis. Further notes were made in the margins of the transcripts and notes to finalize the process of creating codes. Codes were subsequently grouped into categories, which can be defined as “a collection of similar data sorted into the same place” (Morse, 2008, p.727).

Categories are developed using content analysis, in which similar chunks of data are placed proximally. As patterns began to emerge across data sources, and relationships between categories became apparent, each one was revisited using memoing, clustering and factoring, and other inductive analytic strategies (Miles & Huberman, 1994). To move the data beyond a classification of themes, I recontextualized (Morse) data with existing social marketing constructs in order to be able to comment on the utility and implications of the study's findings to policy and practice.

## CHAPTER FOUR

### Results

The results chapter is organized into sections describing: the participants in terms of project-relevant information (age, gender, reason for joining the sustainability and eco-education course, and physical activity level), eight themes which are oriented within a social marketing framework, and finally the effects and actions resulting from the use of Photovoice methodology.

#### *Description of Participants*

As previously mentioned, each of the participants in this study was enrolled in the same elective sustainability and eco-education course. Demographics, project completion status, and personal reasons for taking the course are outlined in Table 2. Also, scores representing physical activity level, as calculated based on participants responses to the IPAQ short form, are included. All participants well exceeded the minimum number of MET-minutes per week in the “high” category, and with the exception of one student, were male. Candidly, participants indicate their two primary reasons for taking the course were an interest in the outdoors and desire for an atypical classroom experience. Thus participants in this study do not reflect the inactive and environmentally disconnected youth described in chapter two. However, these active and connected individuals do offer valuable insights as to framing physical activity in nature.

#### *Resultant themes from Qualitative Data*

We know that social marketing can be an effective tool for designing and evaluating programs or initiatives that will effectively change behaviour (Andreasen,

1995). Both successful program design and evaluation depend on the accurate and specific definition of the target audience. In this section, the perspectives of the target audience are described in detail, with the hope that this information may inform program development and modification for similar target audiences in the future. It is important to recognize that different target audiences will not always have the same values, beliefs, needs or motivations for being physically active in nature. Grouping people together who have shared perspectives makes it easier to reach them and offer meaningful nature-based physical activity opportunities appropriate for their needs and circumstances.

Segmentation at its most basic level can use demographic information, such as age and sex, to group audiences together. However, it is more useful to know and understand the values, beliefs, experiences, knowledge etc. of consumers to create more successful opportunities. This is apparent in the following description of this study's participants, who had some different values, beliefs, needs and motivations, despite being a group of mostly same age and same sex peers.

The first four themes describe the 'what', 'why', and 'how' of physical activity in nature according to this group of youth, and provide a response to the study's first research question: what are youths' perspectives and experiences of physical activity in the natural environment? That is, in social marketing terms, the themes relate to the product of physical activity in nature, its competition, the price (both costs and benefits) of engaging in physical activity in nature, and segmentation of the public/purchaser respectively, from the perspectives of the youth interviewed. The final four themes answer this study's second research question: what strategies do youth recommend for

Table 2

*Participant Demographics and Physical Activity Level as Measured by the IPAQ (Short form)*

Pseudonym	Project		Physical Activity		
	Complete	Sex	Age	Level	Why did you take this course?
P3: Grizzly	Yes	M	18	7942 <sup>a</sup>	To get more in tune with nature, to get out of a dull classroom, meet new people, learn better leadership skills.
P8: Beaver	No	M	18	6291 <sup>a</sup>	To get out of the classroom and try something different.
P6: Hawk	Yes	F	17	6666 <sup>a</sup>	My brother was on it previously and I saw how much he changed (in good ways). I also wanted this, too. It's a really good opportunity and I like the outdoors.
P4: Maple	Yes	M	18	8996 <sup>a</sup>	Just to get outdoors more often.
P2: Cougar	Yes	M	18	6120 <sup>a</sup>	Leadership training, certificates, physical activity, to get out of the standard 'classroom' model of education.
P9: Shark	Yes	M	17	13332 <sup>a</sup>	To raise awareness for me and [about] the environment and have a life changing experience.

Table 2 continued

*Participant Demographics and Physical Activity Level as Measured by the IPAQ (Short form)*


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P7: Snow Leopard	Yes	M	17	4616 <sup>a</sup>	I took this course because I did not like sitting in the classroom. I like the outdoors. I wanted to gain experience and knowledge about the outdoors.
P10: Eagle	Yes	M	17	4080 <sup>b</sup>	I enjoy nature and have tons of fun hiking, boating, and learning about the environment.
P5: Owl	Yes	M	17	5436 <sup>a</sup>	I took this course because I like the outdoors and it leads to many career opportunities in the future.

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Note: <sup>a</sup> Units measured in MET- minutes per week. <sup>b</sup> Units measured in MET-minutes per week, excluding walk data which were unavailable.

engaging with nature as a way to be active? With regard to social marketing, the strategies acknowledge the importance of ‘place’ for engaging youth to be physically active in environmental settings, and are described using the metaphor of a tree.

Beginning with theme five at the roots of the tree and moving up, suggested strategies begin from what may be appropriate for youth who are at the lowest level of engagement (not engaged) to increasingly higher levels of engagement in nature through physical activity. Themes were developed based on the data collected in the orientation and discussion group sessions, and the Photovoice pictures and captions.

*Theme 1: Physical Activity in Nature Offers the Freedom to be ‘Natural’.*

There were four main values that the youth attributed to being physical active in nature: freedom, excitement, calming/relaxing, and creativity. For the value of freedom, students associated physical activity in environmental settings with experiential learning which they found liberated them from the restraints of a typical classroom environment:

It’s like you’re really engaged and concentrating on what you’re doing at the time and nothing else really matters when you’re right there. Like through the kayaking trip around the island, I didn’t even have a cell phone with me. So everything that was happening right then was everything that was happening in my life. (Grizzly)

We’ve all been through where you get the worksheets and all that kind of stuff. Now, we’ve been put in a setting where it’s our own responsibilities and our own learning abilities... we learn by ourselves. I mean, sure we have our leaders that help us out. But I mean we teach ourselves in a way. (Snow Leopard)

A second value that was mentioned by the majority of the group was creativity. Students believed being in nature settings while engaging in physical activity spurred creative thinking and allowed them to think and act ‘outside of the box’.

Really, being out in nature really encourages creativity. Because I mean, I don’t know, playing things like capture the flag or whatever. You’re playing in a certain area yeah, but other than that, anything goes. You can climb things, you can hide yourself different ways, different places. And it encourages you to try new things.  
(Cougar)

In my activities or whatever, I like to be alone because I feel like if I am have someone else with me then I have other ideas and I like to have my own ideas. I learn from my mistakes, or I guess my own experiences and I gain more knowledge I feel like. And then I can bring it to friends or other people. (Snow Leopard)

For some, being physically active in environmental settings was also risky and exciting:

What makes it good for me...like say when I’m scuba diving or surfing or something, the adrenaline. It’s like a risk kind of factor. It’s just an unbelievable feeling. It’s amazing. It’s like... I don’t know, it’s cool. (Snow Leopard)

Just being able to push yourself and try new things. With a fair amount of risk involved it just becomes more exciting. (Cougar)

I like it, like, the physical challenge of it. And it’s one of the only things you can do by yourself that’s actually...[exciting]. (Eagle)

Other students described being active outdoors as a calming or relaxing experience:

[It’s] calming. Like all this noise right now, you wouldn’t really hear that. You’d just hear more of the animals and the birds and the effect is, just more calming. Just

relaxing... And you just forget about all your busy life at home and you just get to think about things. (Hawk)

This first theme relates to the social marketing concept of product. As previously mentioned, the product is “the set of benefits associated with the desired behaviour” (Grier & Bryant, 2005, p.323). This helps determine how those who wish to influence the target audience’s behaviour should frame the product (engaging with the environment) in order to make the behaviour change most desirable. The product can be further subcategorized into the core, tangible, and augmented products (Kotler et al., 2002). Of utmost importance is the core product which refers to the benefits of the tangible product that the target audience believes are most important or valuable. These are closely tied to the audience’s values, beliefs and experiences, and are exemplified by the values and quotes described above.

The tangible product refers to the specific behaviour being offered. In this case, the tangible product was physical activity in nature settings, and meant a variety of ways they chose to be physically active in the natural environment. Some of these were their preferred activities within their school program, and others were things they chose to do on their own time. Many students acknowledged that one of their favourite ways to be active outside was through nature hikes. However, many also mentioned the value of other activities such as large-scale outdoor games, like ultimate Frisbee and capture the flag, and water-based activities:

[I like] larger scale outdoor games. Like, we’ve played, if you can organize capture the flag or things like that where you can play with a lot of your friends running through the bush and things like that. (Cougar)

Mine's kind of on the water. Like, I like scuba diving or surfing, but we don't really have surfing here. In this program I think it was kayaking. I liked kayaking the most. (Snow Leopard)

I'd like to do rock climbing. I think that would be so much fun. I've only done it on fake walls. Because there's so many places in [hometown] probably to do it. (Eagle)

I'm not a water baby, so no water for me. Paintballing would be my favourite.

(Maple)

Snowboarding, [although] I've only done [it] once... I like playing big games like capture the flag and like, ultimate Frisbee. (Owl)

I like to swim a lot, in like, lakes and oceans stuff like that, so it's like aquafit in the water. (Grizzly)

The augmented product typically refers to objects or services that are promoted along with the tangible product to provide encouragement or opportunities or remove barriers. However, they can also be additional 'benefits', as seen by the target audience, that are seen as appealing, but not fundamental, to being physically active in nature. Augmented products try to make the actual experience of physical activity in nature look more fun, attractive, popular, and offer supplemental benefits beyond what they view as part of the core product. While typically not their main motivations, the students believed there were a couple of 'extras' or additional benefits associated with being physically active in nature settings. First, some explained that being active outdoors resulted in positive effects for both their physical health and mental health:

When doing the physical activity this helps my health, both my body and my mind.

The leave no trace motto will help keep the environment clean. (Shark)

Also, students appreciated the experiential learning that they associated with being engaged with nature:

And I know at the beginning of that day we were pretty hyper, energetic. But after we fought across the channel, basically our attention spans were focused. We were tired enough that we weren't hyper, but we were focused enough that we could actually concentrate on learning what we had just done. (Cougar)

Instead of thinking, I wish I was there, now I've actually been there (Snow Leopard). Yeah, you experience it first hand. (Hawk)

### *Theme 2: Friendly Competition*

The second theme that emerged (mostly during the discussion session) related to activities that the participants sometimes chose in lieu of physical activity in nature. These choices, known in social marketing as the competition, are what the audience believes are the alternatives, or what else they could be doing rather than engaging in nature through physical activity. This can include behaviours that are habitual, or are preferred over the tangible product, and organizations or individuals that promote behaviours opposing the tangible product. It is important to know what is 'competing' for the audience's time and energy so that the product can be framed to be better than the alternatives, and/or integrate the benefits associated with the competing alternatives into being physically active in the outdoors.

Interestingly in this group of youth, many of the 'competing' activities they reported involved either being physically active in other contexts, or relaxing outdoors rather than engaging in physical activity. This supports both the IPAQ questionnaire data, which scored the participants as very active, and this group's general interest in the

outdoors. For example, many of the students mentioned other physically active hobbies, such as basketball, hockey, and paintballing:

I go play basketball sometimes. It's something to do, something to take my mind off stuff. (Snow Leopard)

Some chose to spend time outdoors, but not while being entirely active, such as suntanning, camping, or boating:

Mine is boating because I can go so many places on the water... Usually a motor boat I guess, most of the time because you can go a lot more places. You see lots of nature, like whales. (Shark)

Mostly in the summer I do a lot of camping and all that. I don't really do a lot of activities out there, but just relax, and that's my activity. (Beaver)

These quotes demonstrate how many of these participants' 'competing' behaviours are actually closely aligned with the desired product. On the other hand, many of the students also mentioned that they also enjoyed sedentary activities on occasion, including playing a musical instrument and participating in youth leadership groups. As well, television viewing was a common thread among the majority of students. However, while it wasn't directly addressed in the discussion questions, other screen time activities (e.g., online social networks, use of the internet, video games) were not reported by any of students as activities they chose to engage in during leisure time. This is important to note as it may indicate why the participants chose not to sign up and use the Facebook discussion group. When the youth were questioned about why these other activities were more desirable than being active outside, they commented mostly in reference to why

television was so appealing. Competing activities were typically reported as more desirable because they were seen as easier to do and likely more appealing to their peers.

It's way easier to organize something like that with your friends. Instead of trying to plan a game outside, it's like 'hey guys, come on, let's watch a movie'. (Cougar)

Furthermore, television specifically was appealing because there were no personal consequences in watching TV. The youth felt as though it was an opportunity to live vicariously through characters without any of the negative effects, as is aptly described in the following quote from Cougar:

I think it's because when you watch something like that, it always turns out good, no matter what you do, there's really no consequences to your actions. Well maybe not your actions or whoever is on the tube, right? They can run around and kill people or they do this, they blow things up and there's no consequences for it. You don't have to pay for anything. You can just sit there and watch somebody else blow things up. (Cougar)

### *Theme 3: The Price is Right*

The third theme describes the plethora of benefits that the participants believed were associated with being active in nature, and relates directly to the social marketing concept of price. The price of engaging in the environment through physical activity refers to the balance between the benefits these youth expect to experience and the 'costs' they are willing to incur while engaging in outdoor physical activity. Costs can be monetary or nonmonetary (e.g., time, psychological, social, physical), and may be associated with actual physical activity, with being in nature, or both. Costs can also be expressed in terms of entry and exit costs, where the youth see the need to sacrifice

something by adopting the behaviour (entry) or by abandoning another behaviour that interferes with what is being promoted (exit). Benefits might include factors that are social, physical, or psychological. It is the goal to offer more benefits to, and reduce the costs associated with, being active in nature.

First, likely due to the context in which they were interviewed (their sustainability and eco-education course), many of the students associated positive learning experiences with being active outdoors.

It's like you're really engaged and concentrating on what you're doing at the time and nothing else really matters when you're right there. (Grizzly)

I feel like I've gained amazing skills through this course. Like when I go outdoors I feel like at home. I don't know, I've never really liked being in a classroom setting and when I get to experience the outdoors in the outdoors, it's awesome. (Snow Leopard)

Students also saw that there were positive health effects both for themselves and for the environment when they were physically active in nature.

Well it affects all of our health, get some fresh air, get exercise, learn about the environment. By learning about the environment, you can appreciate it more, respect it. There more we get out there the more you love it and you want to protect it. That's why we kind of have these groups and all that. We want to save the planet. (Beaver)

When doing the physical activity this helps my health, both my body and my mind.

The leave no trace motto will help keep the environment clean. (Shark)

Other benefits were also reported, including the ability of nature to evoke creativity, the freedom associated with being outdoors, the calm or relaxation induced, and the factor of excitement that can be present when engaging in nature through physical activity. These benefits were previously described in more detail under the ‘core product’ section. Interestingly, these participants did not report any perceived costs to being physically active in nature aside from the convenience factor associated with competing behaviours, such as watching a movie with friends. Typical costs that individuals may report for participating in any activity might include time sacrifices, fear or discomfort associated with participation, or financial costs. Financial and time costs may have been alleviated due to enrolment in a school program dedicated to outdoor learning. While the students acknowledged there was fear associated with participation in some of their class activities, they viewed this positively as a challenge to overcome and learn from rather than a reason to forego participation.

*Theme 4: When Nature is Rated ‘R’: Lack of Safety, Accessibility, and Social Support as Barriers to Participation*

Understanding the public or purchaser, in this case, the youth, involves getting to know the audience’s needs, including the benefits sought, barriers encountered, and variables influencing their decision to be active in nature. The youth’s perceived benefits, costs, values, and competition as they related to physical activity in nature have been discussed in the previous sections. However, in order to effectively segment audiences into approachable targets, it is also necessary to understand other factors that may influence an individual’s decision to be physically active in nature. These factors include

barriers and facilitators to engaging in the target behaviour, and also social influences that might effect the decision to participate.

Participants mentioned four main things that could act as barriers, or as facilitators in the opposite circumstance: knowledge of the outdoors, accessibility, safety concerns and external restrictions, and time. The following quote exemplifies the importance of having knowledge and experience in facilitating comfort in nature.

I mean, before starting [program name]... whenever I was planning a trip it would be like well what trail do I want to go on, what direction are we gonna be, where are we gonna be... And now it's more like, I'm going in that direction for 4 km and I'm gonna make a fire and I'm gonna find this, I'm gonna do this. Instead of having to plan everything out, it's just like well I know what my environment is like, so I'm just going to get out and enjoy it. (Cougar)

In contrast, lacking sufficient knowledge may lead individuals to feel uneasy in the natural environment, which could, for some, mean less time spent engaged.

Accessibility to nature and certain activity settings in particular was also reported as a potential barrier to participation by this group:

Yeah I think that it would be easier and better if somebody put more activities like close by. Because it's actually really hard to go out. So if we had the rope course like in [city name] or something like that, that would attract like a lot of people. And it's like all with nature. Like if there was like climbing mountains and stuff set up in [city], all of that would be awesome. (Eagle)

Also, their own safety concerns and those of authority figures, particularly in the school setting, and the related restrictions imposed acted as barriers to participation for some youth.

Yeah, same kind of thing, restriction, like you see something really brilliant across a river but it's too dangerous to cross and you really want to look at it closely, but you can't really (Beaver)

The... school or whatever, they don't trust this program very much. And it's hard to do... like go out of the box and go do other things that particularly we wouldn't do in a school surrounding, but they're scared. I don't know what it is, if they don't trust us, or... kinda just trust issues. [It may be because of safety issues but]... it's kind of too safe for me. (Snow Leopard)

Finally, the students acknowledged that time could potentially act as a barrier for some people, though for this group in particular, it wasn't reported as a concern. The students typically believed that time wasn't really the issue for them, but rather just making activity in nature a priority and thus making time for it.

Actually going out and doing it... it can get stressful sometimes I guess if you're working and stuff like that, like, and you're a teenager and you have to do your school work. Yeah, I guess you can make time to go out in the wilderness and enjoy it. (Snow Leopard)

The participants also discussed support (or lack thereof) within their peer and family social networks. There were varied responses to these questions. Some said that their friends were not interested in being physically active in the outdoors and instead

would prefer to choose other activities, while others acknowledged shared interests with friends inside and outside of their classroom.

Yeah, I have friends that used to drag me out all the time... (Cougar)

I used to live on [an island], and that place, there's so many things to do like in the summer and there's lots of outdoor stuff you can do right. But I had a lot of friends on there... they just like sat in their house. And I was like, why do you guys want to do this? Look at this place. You can go and swim, you can go bike riding... And like, dude, there's nothing else to do on this island [besides be outside], why do you want to sit here and do nothing? I'm so glad I moved over here. (Snow Leopard)

I have a friend who went on a camping trip with us, brought her hair dryer, and asked where to plug it in. (Cougar)

Similarly, some had family members who would participate in outdoor activities with them or at least showed interest in the participant's engagement, and others had families who did not participate or share interest.

My family's pretty good for outdoors. They like to get out. (Maple)

Yeah, my family's into it, too. My mom grew up on a boat with all her brothers and sisters so yeah, she's all into outdoors and everything, hiking and everything like that. (Eagle)

My brother was in this program before so that's what made me come into it. And then he made it look really good. And then my parents are always trying to get us to do like family outings, like go on hikes and stuff. And like, some of my brothers don't want to go, but they do go. (Hawk)

For the most part, my family is anti-outdoors... They just kind of sit around the house, drive around in their cars...I'm the black sheep that's different than everything they're used to... They're supportive but kind of "oh, he's doing his own thing. He's doing that, whatever". (Grizzly)

I'll just put it in one sentence. Everyone in my house just sits and plays 'world of warcraft'. My mom said maybe if she was like my age, she might get interested in it. (Owl)

However, regardless of their level of social support from friends and family to be physically active in nature, the participants in this project all had high levels of activity and spent a lot of time being active in nature specifically.

*Themes 5-8: The Rules of Engagement: Strategies for Encouraging Youth to be Physically Active in Nature*

Themes five through eight all reflect youth-oriented strategies for engagement in nature through physical activity, as suggested by this group of already engaged youth. The engagement strategies have been framed in a tree to reflect what may be appropriate for those who are not engaged (at the roots of the tree), to strategies encouraging increasing levels of engagement (Figure 1). Each lower level, respectively, can be seen as somewhat of a pre-requisite for movement into the next level of engagement. In reference to themes seven and eight, both exist within the branches of the tree as they are extensions that may or may not occur after progressing through the strategies described in themes five and six. The organization is an interpretation of the participants' suggested engagement strategies rather than a direct representation of their input. That is, the

participants did not specify that they believed these steps were sequential, but it was implied in their comments.



*Figure 1: Tree of Strategies for Engagement in Nature through Physical Activity*

In keeping with an analysis rooted in social marketing, place and promotion should play an important role in the development of successful strategies of engaging youth to be physically active in nature. Place describes when and where the target behaviour is performed and associated tangible objects or services are received. It is typically important to make ‘place’ as convenient as possible for the target audience. Promotion involves creating a message that informs the audience of the product, convinces them they will experience valued benefits, and inspires them to act. A variety of methods and sources can be used to promote the product, for example, TV, radio, print, electronic media, or word of mouth.

Regardless of the level of engagement, there was one major factor that the youth suggested as important in determining place: convenience. Obviously, in order to be

physically active in nature, it would be a requirement for the 'place' to be in a nature setting. This may cause complications for some youth since accessing natural settings can be difficult if they are not proximal. The importance of accessibility and proximity of nature was discussed in the context of barriers and facilitators to participation. This is somewhat ironic given that the town in which the participants lived is well-known for its natural attractions and to outsiders, is advertised as a place where nature is readily accessible. Nonetheless, just as in bigger cities with substantially less green space, accessibility and proximity of nature were perceived issues for these youth.

The group generally agreed on one solution that answered concerns with the accessibility of place and also related to promotion through distribution channels. Creating a course dedicated to, or generally providing the option of time in school for, physical activity in nature would inform youth about the importance of these activities, and offer accessible activities both in terms of time and location. This idea was expressed both by the students and by their teacher, as shown in the following quotes:

But looking at it on a larger level and just the importance of providing the opportunity for students to do it, providing them space... young people space in their busy lives to actually go out and engage in that kind of learning...But we've kind of just let it go and institutionalized a different kind of learning. So I think when we can incorporate it into the school system, like this program and some other programs. Just the fact that it's being done in and of itself is fantastic. (Mr. Smith)

Yeah, I think there should be like a course. Like a mandatory course in grade 12 like ecology, getting out there. Like a [program name] that was like one class a day, like English 12 that's mandatory right. We should have a course that teaches them

about the planet. It would help our peers so much and like teach everybody about what's actually going on. And it could help the world a lot if they actually did it, and made a course and taught it. (Grizzly)

*Theme 5: Recreation→ Reduce, Reuse, Recycle: Time in Nature Encourages*

*Environmental Values*

The 'roots' of the engagement tree represent the foundation of engagement in nature through physical activity. That is, it suggests the importance of getting youth to just spend time being in a natural setting. The participants commonly suggested that the first step in developing care for the environment and for understanding one's role in environmental health was to simply spend time in the outdoors. They believed that quality time spent in nature would contribute to developing environmental values. This idea is represented in the following quote:

Being physically active in nature [means]... We get out there, do more stuff, appreciate it more. You want to help out. (Snow Leopard)

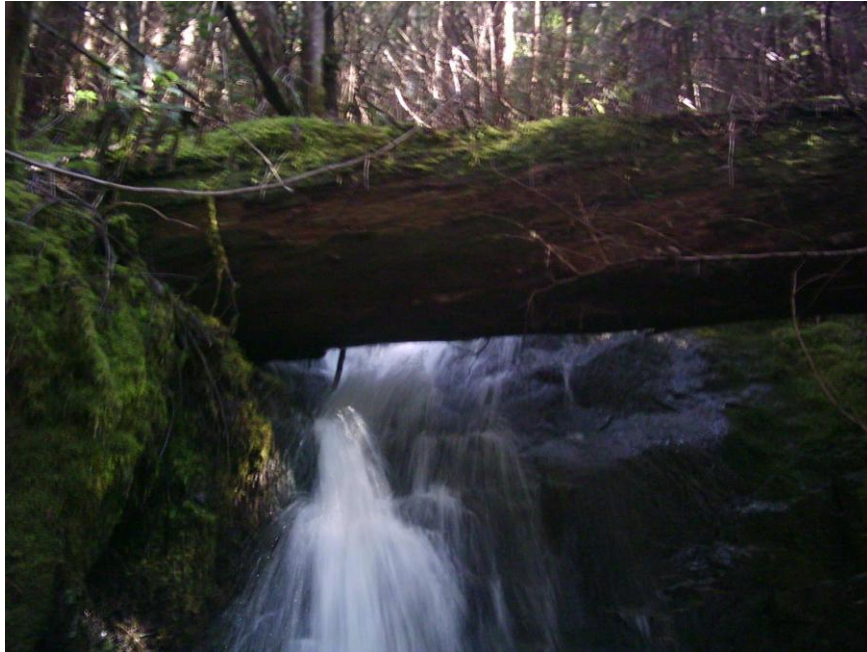
The pictures and respective captions from two of the participants, Hawk and Snow Leopard, also represent the idea that just spending time in nature may help people to care about the environment. In Hawk's caption, she explains that being still in nature and attending to the surroundings helped her and her friend feel connected with the environment.



*Figure 2:* Hawk's picture and caption

My friend and I got physically active to get to that beautiful place moving our muscles getting out there and breathing the fresh air. It helps my body and mind by making me focused on what I was doing at that time. Then when we got to that place we became still, soaking up the environment... This put us in touch with nature. This kind of experience also motivates people to act on behalf of nature.

Similarly, Snow Leopard's caption highlights the importance of showing people how beautiful nature is and simultaneously how proximal it can be. It states that spending time in these settings should encourage care for the environment as he has learned based on his own experience.



*Figure 3: Snow Leopard's picture and caption*

I was looking to illustrate that we have these magnificent displays of nature in our own backyard. What is happening is that we all stopped because...the waterfall caught all.....of our eyes and we all needed to get a picture of this magnificent artwork in nature... I think people should actually experience the outdoors as we did, so they will see what is there and care about it like I do. This affects my health because water is essential to humans and life...

In sum, the participants believed that for persons who are not already engaged in the environment through physical activity, spending time outdoors is an important step towards developing environmental values, becoming more engaged and therefore positively affecting personal and environmental health.

#### *Theme 6: Get your Hands Dirty: The Importance of Experiential Learning*

Something that came up in response to various questions was the value of the experiential learning that can occur when youth are active in the environment. Of course, this theme was obviously influenced by the context in which the participants completed their projects. That is, many of their experiences being physically active in nature, or at

least their most recent experiences, took place in the outdoor sustainability education program in which they were enrolled. Regardless, the learning that resulted from being actively engaged in the environment was paramount in terms of the benefits and values as seen by these youth. Not only was the learning aspect important, but further, so was the appreciation for nature that developed as a result of hands on experience. The importance of experiential learning in both education and nature appreciation is apparent in Cougar's picture and caption.



*Figure 4: Cougar's picture and caption*

This is an excellent example of the spirit of true learning. Each person in this picture is engaged in their environment, exhausted through their personal experience and ready to learn about something that they have explored but do not fully understand. One problem that teachers face every day is the challenge to engage their pupils, to focus a class' combined attention span on a topic that the students have never seen, heard, felt, or smelled. Learning is augmented through physical contact with an object or element, and people are much more willing to learn about something that interests them. Creating interest by encouraging personal experience is the first step to involved learning.

This theme was also reflected in the first few sentences of Mr. Smith's picture and caption below:



*Figure 5: Mr. Smith's picture and caption*

... The students in this picture are on an ocean kayak trip. In a way it seems intuitive that this type of experience can have a ripple effect- indeed, a humble experience like this acts to make the world a better place! I think society is picking up on this. Government seems to be paying attention to the connection between the health of the person and the health of the environment. This is one of the greatest benefits the world receives from having us spend more time outside.

The latter part of this caption comments on the connection between human and environmental health, and relates how experiential learning may contribute to both human and environmental health. As such, it provides a nice bridge into the next theme in the tree: developing consciousness of human-environment interactions.

*Theme 7: Growing Awareness: Consciousness of Human-Environment Interactions*

As a result of spending time being active in nature, particularly by engaging through experiential learning, these youth were aware of the interactionary relationship between human and environmental health. That is, the participants understood that by

spending time being physically active in the environment, they experienced positive effects for their physical and mental health. On the other hand, they also acknowledged that by spending time in nature, they were more likely to care about the environment and therefore to look after it and minimize personal impact through their interactions. As such, their experiences engaging with nature would positively influence environmental health. Furthermore, engaging with the environment in a way that either positively impacted its health, or at least avoided negative impact, thus contributing to a healthy environment, would then mean that their personal health would be even more positively affected. These concepts are reflected in the pictures and captions below, submitted by Shark and Maple, respectively.

Shark's picture represents one side of the human-nature interaction. In his caption, he explains how he is demonstrating the negative impact humans can have on environmental health, and how far reaching even seemingly minor actions can be, such as with barges carrying sawdust.



*Figure 6:* Shark's picture and caption

This picture changed my perspective on looking at boats because I realized how much those actually affect the shoreline. Always when we would go and make fires down below, I'd see all these chips...and I realized that the chips are actually off those [boats]. Like, even on our kayaking trip, there was like a foot of it which is a lot of chips that shouldn't be there. It actually shows you how far humans' garbage can actually go. You can actually see the outline of the sawdust on the top [of the boats]. They're trying to just get a few extra buckets in, and then all that, or most of that, falls off on the way up here, so they're losing like 5% of their load anyway.

Conversely, Maple's caption and picture demonstrate how humans can positively affect the environment by making use of environmental 'waste' rather than creating new products that may have a negative environmental impact. Simultaneously, spending time in nature gathering environmental waste to use can improve human health by encouraging physical activity and time in nature.



*Figure 7: Maple's picture and caption*

I chose this one for showing what kind of stuff people can make out of reusing environmental waste like broken branches or animal bones. You can make knives out of them or make them into tools or axe heads... Instead of making more man-made stuff, we should reuse the environment that's already dead or dying or stuff that's just waste. It's like recycling. It would be a good environmental move and it would be good for people's health just to get out there in the environment and explore.

*Theme 8: Test the Waters: The Role of Challenge in Health*

The final theme revolves around the role of risk-taking in health. Although it may seem counterintuitive to some people, this group believed that taking risks and challenging themselves in nature settings were integral to good health. This is ranked in the highest level of the tree, the branches, because in order to take risk being physically active in nature, spending time in nature and interacting with nature would be prerequisites. This theme in particular seemed to be encouraged by the teacher's beliefs and values.

I think one thing that we've learned in the last couple... in the last week doing the kayaking is there's a certain element of danger there. There's fear and it's kind of legitimate in a lot of ways. You're going into cold water. But by taking that risk, you benefit from it. We've talked about that a little bit and we've also, I mean philosophically in this class, we've talked about how risk is beneficial to helping you conquer things in your life and achieve goals and believe in yourself. And there's a certain amount of risk that's... important to happen. Life without risk is... pretty boring. (Mr. Smith)

Mr. Smith's sentiment was echoed by the students, as shown in this quote from Snow Leopard:

I don't know, what challenged me mentally was I went under, and I did it perfect the first time, but then the second time I went under and I got stuck. I was stuck under the kayak and I didn't have any air. And like I got out eventually but...even when I was sleeping I would have dreams of being stuck under a kayak and then it was... the day I had to do it again it was really tough on me. I was like, woah, this is weird right because I was so ready to do it but then I was like maybe not. But I overcame that. But it just really had me going... Overcoming it made me stronger and I felt... I don't know, more focused and more relaxed and I believed in myself more that I could actually do this and went through it. (Snow Leopard)

#### *Results of Using Photovoice Methodology: Steps towards Action*

An important component of using Photovoice methodology is the potential to initiate action in favour of the participants. Guba and Lincoln (1989) call this process catalytic authenticity, meaning the extent to which action is stimulated by the research

processes. This occurred in three main ways in this study, two of which were directly and immediately felt by the participants. First, the participants exhibited evidence of conscientization, where they were able to reflect on their roles in the world and question their relationships to it, and furthermore, reflect on how they transform it through their actions, thus resulting in an experience of liberation through experiential education (Freire, 1970; Freire, 1993). They expressed that this reflection occurred both through participating in their school program and through participating in the Photovoice assignment. The following quote, picture, and caption, provide an example of how the students became more aware of their surroundings:

Yeah ... I'd be like, I kind of just want to get there, let's go. But now since doing this project you have to take a picture of something right, then we all stop, and click a picture. It's a different world through the glass... (Snow Leopard)



*Figure 8:* Grizzly's picture and caption

It's a picture of a bunch of flowers that was taken while I was running. I was jogging along a trail at [a] bay and kind of took my camera out and hit the button accidentally and it took a picture. And, I don't know, I started thinking about how brief moments in nature can be just like that. Like, you take a picture, and it's really good. I didn't even notice what was going on. I didn't notice until after the run, at home the next day, when I was looking through my pictures and then I realized where it was. It made me realize what [nature] is worth.

Students also expressed an increased self-awareness as a result of participating in the course and the project:

Not so much that who I am has changed, but I guess my point of view has kind of been enlarged. Like I understand more, so naturally my opinions have definitely changed. I guess with understanding with what you're affecting, you want your actions to change... When you're taking pictures of things, you actually focus on it more. You look for something to take a picture of and try and think of how you can express yourself through that. (Cougar)

Furthermore, participants acknowledged that through participation in the course, they had become more aware of their interactions with the environment and the positive and negative effects they can have on the environment.

Yeah, I think it's changed because I never really got out into the environment when I was in Edmonton so I just was always in my house. So I respected my house more than I did nature I guess. (Maple)

And some of it was just through the course as well. We had some people come in here and tell us about the environment and stuff like that and I started taking staggered showers and whatever else, and just little things. (Cougar)

Second, as described in the methods section, three students were nominated by their classmates to represent the participants during a presentation to their local school board members. The students who participated in the presentation expressed that they felt they had made a positive impression on the school board and were pleased that the school board members were both receptive to, and interested in, their presentation. Members commented that they were happy to have the presentation and appreciated that the students showed courage by speaking in front of a group. Two members also asked the students questions, which the students felt demonstrated interest. When they were asked about the experience immediately following the presentation to the school board, they indicated it was a positive experience on the whole and they were happy that they were able to participate. Their comments indicate that the presentation was an empowering experience for the students, and allowed them to see how they can communicate with persons whose decisions affect their lives and the lives of their peers.

It was a positive experience. I was happy they asked some questions. It showed that they were listening and they thought the presentation was interesting. (Cougar)

I am happy I participated in the presentation and I'm happy that it's over [because I was nervous]! (Snow Leopard)

The third demonstration of positive action was equally important, but influenced the participants less directly. In fact this instance demonstrated how the participants may have influenced others towards positive action. Approximately a month following the school board presentation, an article (Appendix G) was published in the local newspaper about the Photovoice project and the presentation the students made to the school board. The article discussed the value of the outdoor program and the Photovoice project, and

included quotes from the presenters. This contributes to action in that information about the importance of the program and the positive effects it has on students is distributed throughout the community, and thus spreads the word about the importance of physical activity in nature. This may serve to initiate community members' thoughts and considerations of their own actions related to the environment and physical activity, and perhaps encourage them to follow the lead of the students in the article.

In sum, youth in this study, already very active and experienced with the outdoors, described how their engagement with nature provided them with a sense of freedom to be themselves, whether it was acting on values of creativity, excitement, or relaxation.

## CHAPTER FIVE

### Discussion

As presented in chapter one, there is a large body of literature supporting the positive health effects of engaging with nature and participating in physical activity, as well as recent work demonstrating the potential synergistic effects of being physically active while in a natural environment. However, published research to date has not represented youth perspectives on the values and benefits of, barriers to, and beliefs about engaging in nature in a physically active way. This information is certainly of utmost importance considering there is research identifying the necessity of youth involvement in program development and implementation in order to yield program acceptance and success (Hohepa et al., 2006; Skinner et al., 1997). Further, there is an urgent call for effective programs to address the internationally inadequate rates of youth physical inactivity which contribute to a plethora of health concerns, as well as the declining health of the natural environment. The need for effective youth health and environmental health programming is becoming apparent to government and decision-making bodies locally (in British Columbia) who are acknowledging the issues of youth health and engagement with nature in their agendas (e.g., [www.actnowbc.ca](http://www.actnowbc.ca); [www.childnature.ca](http://www.childnature.ca)).

Using Photovoice, a research methodology shown to be effective in actively engaging youth in exploration and expression of their own health issues (Necheles et al., 2007), this study set out to begin to fill a gap existing in the literature by trying to understand youth perspectives on engaging with the natural environment through physical activity and the effects on health. This chapter begins with a discussion of the results of this study in regard to their contribution to the existing literature, divided

according to the eight themes described in chapter four. The remainder of the chapter is divided into sections discussing this study's implications for practice and finally recommendations for future research.

The first four themes discussed in the previous chapter (results) provide some insight into the perspectives of youth who are already physically active in nature settings, in terms of what they perceive as associated values, benefits and costs, barriers, and alternative activities. Further, the latter four themes (i.e., themes five through eight) in the results section address strategies for and/or levels of engagement. In their descriptions of their own activities and suggestions surrounding how to engage, the youth described four basic steps of increasing engagement with the environment through physical activity, from simply spending time in nature in order to develop environmental values, to actively interacting with nature, resulting in respect for nature as a part of our health and greater personal health through facing its inherent challenges.

*Theme 1: Physical Activity in Nature Offers the Freedom to be 'Natural'.*

As discussed in chapter four, these participants attached four main values, or core products, to participating in the various outdoor activities they described: freedom, creativity, excitement, and relaxation. The value of 'freedom' for these students was related to the availability of experiential learning associated with the outdoor classroom as opposed to typical classroom learning which the students found restraining. In a study about women's experiences of being physically active in an urban park in New York city, participants similarly expressed a sense of freedom associated with engaging in nature-based physical activity. For instance, one participant believed that exercising in the park allowed her to experience nature and escape the bustle of in the city in a setting that felt

“separated from the urban environment” (Krenichyn, 2006, p. 636). Also, as described by the study’s author, participants reported that:

Exercising in the park also allowed them to ‘zone out’, contemplate, and organize their thoughts. They described a sense of ‘freedom’ and a chance to achieve a meditative state, which they described in terms like ‘peace of mind’ or ‘clearing out the cobwebs’ (p. 637).

A second value that was mentioned by the majority of the group was creativity. Students believed being in nature settings while engaging in physical activity spurred creative thinking, and allowed them to think and act ‘outside of the box’. Previous research provides evidence of the value of creativity in nature, though in different age populations than that of the present study. For instance, Charles (2009) discusses the historically known importance of nature in childhood development, stating:

Children’s cognitive flexibility and creativity are enhanced if they have the experience in childhood of problem-solving in natural settings versus highly controlled, human-dominated, managed settings like concrete playgrounds and manicured playing fields with ecological diversity (p. 468).

It is evident that these youth, though younger and older than the subjects of the previous quotes respectively, still seek out environments in which they can be free and creative and further, value this opportunity to engage in creative expression. Thus the opportunity for creative expression in nature may be a developmental necessity for children, but it seems to be no less of a desire for these adolescents. Also, other studies have reported the calming abilities of nature as described by these youth, mainly using

measurements of stress reduction (Kaplan & Kaplan, 1989; Maller et al., 2005) and mood (Pretty et al., 2005; Pretty et al., 2007).

Finally, as demonstrated in a number of other studies (e.g., Pretty et al., 2005; Pretty et al., 2007; Takano et al., 2002), many of the youth in the present study believed that being active outdoors was beneficial to their physical health and mental health. Interestingly, though these youth knew participation in these activities was good for health, it wasn't their primary reason for participation. Rather, health benefits were seen as an augmented product, or 'bonus' to being active in nature, in addition to their four core values. Perhaps this is not surprising given that enjoyment and not health is often a driving motivation for youth behaviour (McCarthy, Jones, & Clark-Carter, 2008; Sirard, Pfeiffer, & Pate, 2006).

### *Theme 2: The Friendly Competition*

Considering the high rates of screen time viewing typically reported by Canadian adolescents (Shields, 2006), it is not surprising to hear the participants in this study report a screen time activity, specifically watching television, as a competing activity to being physically active outdoors. Indeed, youth surveyed in the Campbell's Survey on Health and Well-being reported 20 hours of weekly screen time (i.e., watching television, playing video games, computer use), and a survey of high school students in Ontario reported an average of 19 hours a week (Leatherdale & Wong, 2008). On the other hand, it is interesting that the youth in the present study did not mention video games or computer use, including the use of online social networking sites such as Facebook, as competing activities. While this does not mean that the participants did not engage in these activities (they were not asked specifically about them), many of them did not have

Facebook accounts, nor were they familiar with the process of registering for an email account, information which the researcher obtained while encouraging the youth to join a project Facebook group during data collection.

The activities that were reported as competition by this group were also atypical in that many actually involved either being physically active (e.g., hockey, basketball, paintballing), or being outdoors (e.g., sunbathing, motor boating), just not doing both in combination. As such, much of the reported competition is ‘friendly’; that is, it actually reflects desirable alternatives to being physically active in nature from a health promotion stand point. Although this groups’ competition is more likeable than the majority of sedentary (e.g., Shields, 2006) and indoor (e.g., Rivkin, 1997) activities usually reported by youth, participants’ typical reasons for choosing competing activities are in keeping with other adolescents’ qualitative reports about their barriers to participation in physical activity. For instance, when competing activities were chosen instead of the target behaviour, participants explained that this was usually because they were viewed as enjoyable, more effortless (both to organize and to physically participate in) and more appealing to their peers. Lack of peer social support, enjoyment and lack of ease in participation due to accessibility and availability issues are all factors that have been previously reported as barriers to youth participation in physical activity (Hohepa et al., 2006; Gibbons et al., 1999; Humbert et al., 2008).

### *Theme 3: The Price is Right*

To reiterate, the price of the product is the sum of its costs and benefits as they are seen by the target audience. These youth were unique in their views of only reporting benefits associated with being physically active outside, with little mention of anything

that could be interpreted as a cost. Clearly, this is not the perspective of the average Canadian youth in terms of the price of physical activity or time in nature, or we would see substantially higher rates of both behaviours, and thus have little to address in terms of youth health related to physical activity and nature contact. Contrarily, as mentioned in chapter two, the youth in this study consistently reported a ‘high’ activity level as measured by the IPAQ- short form questionnaire. In comparison, the proportion of youth just meeting the recommended level of daily physical activity is reported to be as high as about 50% (Stone et al., 1998), to as low as only 21% (CFLRI, 2005) depending on the criteria used. Nonetheless, while the scores used in this study are measured in different units than the self-report levels from these previous studies, it is safe to say that this study’s participants are substantially more physically active than the average since they all greatly surpassed the minimum score for a ‘high’ active classification.

In addition, this study’s participants appear to perceive more benefits and fewer costs to spending time outdoors than youth in other studies, and as a result, enjoy spending time in nature. While the relationship cannot be attributed to causation, this study’s participants also believed they could take action to counteract environmental issues, and were engaged in pro-environmental activities, such as leading camps with grade sevens to facilitate time outdoors as well as teaching environmental knowledge and skills. In contrast, young people in other studies have reported ambivalence toward environmental issues due to seeing little personal impact, a lack of large-scale action, and perceiving little chance of change (Connell et al., 1999), or have expressed concern but lacked knowledge about individual behaviours that could counteract the problem (Hicks & Holden, 1995; as cited in Hicks & Holden, 2007). As such, many report that they are

not contributing in any way to change (Hicks, 2007). It seems then that the current youth differed from those interviewed in other studies in their belief that they could make a difference through their personal actions.

*Theme 4: When Nature is Rated 'R': Lack of Safety, Accessibility, and Social Support as Barriers to Participation*

The youth in this study discussed three main issues that could possibly act as barriers to being physically active in nature: lack of accessibility, safety, and social support. A variety of other studies have also reported one or more of these issues as barriers to being physically active, spending time in nature, or being physically active in nature specifically. For example, qualitative studies asking youth about their barriers to being physically active have reported both lack of peer or parent social support (Hohepa et al., 2006; Humbert et al., 2008) and low accessibility and/or availability of physical activity opportunities (Hohepa et al., 2006; Gibbons et al., 1999; Humbert et al., 2008). Accessibility to nature has also been reported by some to be associated with increased levels of physical activity, meaning that having less access to nature may be barrier to being physically active for some (e.g., Davison & Lawson, 2006).

Accessibility is also consistently reported as a barrier to spending time in nature. This is true for a variety of reasons. First, in the most literal sense, increasing levels of urbanization mean that, for many people, green spaces are increasingly scarce and less proximal in relation to where people live (Tzoulas et al., 2007). In addition, accessibility for certain populations, especially children, may be more limited than in the past due to increased institutionalization through school and extra-curricular activities and lack of

parental supervision due to the necessity for both parents to work (Rivkin, 1997; Charles, 2009; Moore, 1997).

Others have also found that accessibility and use of green spaces are determined by more than mere physical proximity. One study used geographic information systems to determine physical access to a community forest, along with ethnographic research to investigate how accessibility affected people's use of the forest. The qualitative results revealed that despite having relative proximity, many people interpreted the community forest as inaccessible for other reasons, such as: certain behaviours were seen as acceptable in the setting (hiking), whereas others were seen as unacceptable (using a laptop); feelings of exclusion due to ethnicity; lack of owning 'proper' equipment, or knowledge of how to engage in 'acceptable' activity; and a lack of facilities (e.g., café, barbeque facilities) that some saw as appealing in using the space (Kessel, Green, Pinder, Wilkinson, Grundy et al., 2009). Other studies have also reported symbolic inaccessibility by some social groups or cultures (Pretty et al., 2007).

Just as increased accessibility is likely to encourage greater levels of physical activity and time in nature, social support is known to be a facilitator in encouraging individuals to be physically active, and likewise, has also been demonstrated to facilitate engagement with nature. In a study of 51 members of land management groups, people reported an increase in social networks as an indirect benefit of participant in conservation activities (Moore et al., 2006). Social aspects were also reported as benefits of, and reasons for continuing participation in, green gym activities (Birch, 2005).

Finally, these youth reported that authority figures, mainly teachers and school officials, often perceived that certain outdoor activities were unsafe, and this limited their

ability to engage in such activities. Safety as a real or perceived barrier is believed by some to be a major contributor in children's decreasing contact with nature. Moore (1997) explains that factors such as an increase in traffic density limit the range within which children are able to play outdoors safely, and thus limit their interaction with and knowledge of their local environmental characteristics. Also, many parents believe abductions, kidnappings, and/or physical harm are risks associated with their children playing outdoors. Although these may be genuine threats, media tends to sensationalize cases where these events occur, making them appear more common and causing a distorted sense of reality (Moore). Thus, parental safety concerns may keep children inside.

Although these youth did not report that they were personally concerned about the safety of outdoor activities, participants in other studies have perceived personal safety as a barrier. For instance, in a qualitative study of women's experiences with exercise in an urban park, some women expressed feeling comfortable with entering the inner wooded areas of the park, but others were reluctant due to concerns about personal safety, perceiving the wooded areas to be hidden or dangerous (Krenichyn, 2006). Similarly, Pretty and colleagues (2007), also report that people sometimes perceive natural spaces as 'risky' due to fear of crime.

*The Rules of Engagement: Strategies for Encouraging Youth to be Physically Active in Nature*

Youth participants' suggestions for strategies of engagement mirror those in the literature. First, there is a significant body of literature that has investigated the significant life experiences (SLEs) of persons who are currently environmentally active.

The goal of SLE research is “to determine the sources of commitment to environmental action of environmentalists by asking them to recall the formative experiences that have led to their involvement” (Arnold, Cohen, and Warner, 2009, p. 28). Research to date has indicated that different SLEs, when considered in combination with environmental knowledge and skills, can distinguish an environmentally active person from one who is less environmentally active (Chawla, 1999).

For example, in one study investigating SLEs, open-ended interviews were conducted with environmentalists from the US and Norway (Chawla, 1999). The majority of the participants were between 30 and 49, with the remainder over 50 years of age. The foremost explanations of commitment to environmental issues were spending time engaged in natural areas, usually during childhood, and the perspectives of family members related to the importance of the environment or social justice in general. Other major sources of influence included: participation in environment or outdoor organizations throughout life; negative experiences, including destruction of a valued natural place and fear of environmental toxins; and finally, education, which sometimes encouraged new or modified environment attitudes through participation in inspiring classes or the guidance of inspiring teachers.

In another study of young environmental leaders (16-19 years old) in Canada, all twelve participants reported that the main factors contributing to their involvement were relationships with others who were passionate about the cause and powerful experiences with nature (which did not always occur in early childhood). Further, beyond nature experiences and parental influence, ten participants also noted that there was a passionate figure present in their life, usually during early adolescence, which heavily influenced

their transition into active environmentalism. As such, in addition to the suggestion in past literature of encouraging nature play with children, it appears outdoor environmental experiences and youth gatherings, regardless of the venue, are important in the development of young environmental leaders (Arnold et al., 2009).

While the findings of both of these studies are limited by the lack of a control group (i.e., people who are apathetic or against environmental protection) and by failing to use longitudinal research methods (Chawla, 1999), they still provide some support for the value of the suggestions of this study's participants. Specifically, these youth believed that their experiences spending time in nature were integral to developing pro-environmental attitudes. Many of them also mentioned having parents or friends that encouraged or participated in nature-based activity with them, and had the significant experience of the outdoor education course during adolescence with their passionate teacher as a guide and role model.

Second, the comments of youth in past studies provide support for the importance of incorporating experiential learning in outdoor or environmental education. In one study that assessed diverse urban youths' (aged 7-14) definitions of nature, participants indicated that environmental education should include interactive programs that are developed from the youths' perspectives (Wilhelm & Schneider, 2005). Also, in their study of youth environmental attitudes, Connell and colleagues (1999) found that youth believed personal experiences to be the most trusted sources of environmental information, with the media typically being the least trusted source (with the exception of some documentaries). This suggests that in order for youth to truly care for the

environmental and understand environmental issues, it is imperative, as the youth participants in the current study argued, that young people experience nature first hand.

In addition, the literature on environmental education consistently demonstrates that, while school instruction may be important in some cases, educators need to allow for and encourage the out-of-school experiences interacting with nature that are consistently reported as integral in the life path of environmentalists. Further, settings outside of school need to offer adequate green space to ensure that hands-on learning in nature is involved in the daily lives of young people (Chawla, 1999).

Third, these youth were aware of the interconnectedness of human and environmental health, and understood the importance of having this knowledge in developing one's desire to carry out pro-environmental activities. That is, they felt it was important to share this information with friends and with a younger cohort of students by leading educational and experiential camps. Other projects, such as the Intergenerational Landed Learning project, have acknowledged the importance of generating this understanding in children as they grow in order to help them develop an emotional connection with nature (Mayer-Smith, Bartosh, & Peterat, 2007). In this project, elementary school children were teamed with elders to work in gardening and farming in order to better understand where food comes from. Children's relationships with the environment changed over the duration of the project, with a shift in viewing the environment as an external object or place to seeing the interconnectedness between humans and nature. The authors attribute the "connected notion of the self in the environment... to the increased understanding of the ecology and interconnections of nature" (Mayer-Smith et al., p. 82). A further result of this understanding of connection

was a greater sense of responsibility, or feeling of moral obligation, to care for the environment (Mayer-Smith et al.).

Finally, this group believed that taking risks and challenging themselves in nature settings were integral to good health. Other studies have likewise indicated the value that outdoor adventure participants place on experiencing challenge, though usually other participants do not specifically identify challenge as a health-related value. For instance, especially in studies investigating the benefits of wilderness therapy, participants have reported the role of nature as a source of challenge being beneficial (e.g., Pohl, Borrie, & Patterson, 2000). In a study using both longitudinal methods and retrospective questionnaires, Kellert and Derr (1998) explored the views of individuals who had participated in an extended wilderness travel and education program through one of three different organizations. The program participants explained that challenging themselves in unspoiled nature settings resulted in significant and even profound changes in self-concept as well as coping and adaptation abilities. Furthermore, experiences were also said to exert a major impact on individuals in numerous ways, including: increased self-confidence, self-esteem, independence, autonomy, and initiative; personal and intellectual development as well as development of outdoor recreational activities and environmental interests; and “greater respect, affinity, appreciation, and sense of humility and spiritual connection with the natural world” (Kellert & Derr, p. 60).

In addition to relating to past literature findings, the engagement strategies suggested by the youth also help to answer this study’s third research question about how participation in the Photovoice projects and discussion influenced participants’ conscientization of health in relation to nature. That is, it is apparent from the suggested

strategies, particularly the ones described in themes seven and eight, that after completing the Photovoice projects, these youth exhibit conscientization of human existence ‘with’ rather than ‘in’ the world (Freire, 1970). Although they expressed, in different words, that their sustainability and eco-education course helped them to become ‘conscientized’, they also believed that participating in the Photovoice projects and discussion enabled a greater realization of how humans actions affect environmental health and environmental health simultaneously affects humans. Without labelling the strategy as ‘conscientization’, these youths’ proposed strategies ultimately suggested the necessity of engaging people in this process when they noted the importance of teaching others to understand and appreciate human-nature interactions.

#### *Implications for Practice*

As discussed throughout this chapter, many of research participants’ perceived values, benefits, costs, and suggestions for engaging others in nature-based physical activity are supported by past literature with adults and youth who engage with nature in a physically active way. It can be said, therefore, that this group is similar in many ways to other individuals who are involved in physical activity in nature, and particularly other people who support pro-environmental causes and behaviour. That is, using a social marketing framework, the data were initially analyzed to understand each youth’s (i.e., consumer’s) perspective of their experiences, but using the concept of segmentation, these individual experiences may be grouped with others who are similar and subsequently interpreted collectively. However, it is clear the participants of this study are a unique group of youth, particularly with respect to their levels of physical activity and amount of time spent outdoors, and as a result, the findings of this study may not be

entirely representative or applicable to youth beyond these circumstances. Beyond the factors that have already been mentioned throughout this document, there are some other considerations to attend to when interpreting this study's findings.

First, it is necessary to acknowledge that the concept of biophilia is likely not consistently applicable with all individuals in all circumstances. The extent to which a person is affected by nature (e.g., plants) may be largely shaped by individual traits and cultural and other characteristics (Grinde & Grindal Patil, 2009). For instance, Korpela and colleagues (2008) noted in their study that the restorative potential of a nature setting may be influenced by the amount of time spent in the location, presence or absence of physical activity, and the extent to which a person is nature oriented. Considering that biophilia is a modifiable concept, nature's ability to affect an individual may change over time as the result of individual learning. However, it is believed that even for persons who do not have an overt attachment to nature that a lack of healthy nature can, nonetheless, have an adverse effect on health (Grinde & Grindal Patil). Furthermore, in a study that assessed the well-being (as measured by self-esteem and total mood disturbance scores) of ten outdoor recreation participants, researchers found that engagement in outdoor recreation activities significantly affected well-being regardless of the type, intensity, or duration of the outdoor activity in which they participated (Pretty et al., 2007).

Second, based on the suggestions of this study's participants and the findings of past research, it appears that both the education and parks and recreation sectors could play roles in encouraging physically active time in nature. Recent research has suggested that parks and recreation providers can assist in these activities. Using secondary data on

supply of outdoor recreation infrastructure and demand for outdoor activities in combination with population physical activity level and weight measurements, one American study found that where there was a greater abundance of hiking and urban trails, adults were more physically active than those in areas with lesser numbers. The authors of this study suggest that parks and recreation sectors can encourage physical activity in nature by providing adequate, proximal, and accessible infrastructure, like trails and sports facilities, creating incentives for youth to become more active through parks and recreation, and identifying and targeting at-risk groups to understand their preferences and perceived and physical barriers to participating in outdoor recreation (Rosenberger, Bergerson, & Kline, 2009).

Similarly, the education sector can play an integral part in encouraging outdoor physical activity. The students in the current study emphasized the importance of incorporating experiential outdoor education into the regular school curriculum in order to encourage the development of environmental values, as well as make education more personally meaningful for students. Research on SLEs also has indicated that environmental educators need to incorporate the type of interactive nature experiences that are so frequently reported as integral in the life path of people who are environmentally committed (Chawla, 1999). In addition, as mentioned previously, youth report that the most trusted sources of environmental information are personal experiences; however, they also state that schools are believed to be a reliable source of environmental information, despite the fact that schools are currently seen as lacking appropriate environmental curriculum (Connell et al., 1999). Other evidence suggests again that while in a few cases the school setting was seen to support the development of

the path of young environmental leaders, many found the traditional high school classroom to be stifling, or even irrelevant (Arnold et al., 2009). Collectively, this research indicates that schools seem to be a highly underutilized source of meaningful environmental education, despite having a great deal of potential to nurture environmental leaders. Experiential outdoor classes, such as the one participants in this study were taking, are typically elective and thus may only appeal to students already predisposed to nature and environmental values (again, as with this study's participants). The Planning 10 curriculum in BC high schools offers another avenue to introduce environmental education through its health module. Planning 10 is a required course for graduation and would therefore reach every BC high school student.

#### *Recommendations for Future Research*

While this study was able to offer a first look at the perspectives of a group of already engaged youth, much more research is needed to expand this area as well as the potential reach of this study. First, it is necessary to conduct research with youth engaged in physical activity in nature to varying degrees, including those who are currently inactive and disengaged from nature. It is very likely that youth from different backgrounds will perceive different values, costs, benefits, barriers and strategies for engagement than the youth in the current study. Therefore, designing a campaign or effective programming to engage youth in physical activity outdoors would require further background research with the youth at various current levels of engagement and perhaps further audience segmentation depending on the results on the background research. Appropriate campaign strategies and programs would be best designed by youth, with youth perspective in mind.

Social marketing provided a useful framework for this study as a method of understanding the consumer perspective. The utility of social marketing in the present study, as well as past research demonstrating its effectiveness (e.g., Wong et al., 2004; Huhman et al., 2005; Zucker et al., 2000) suggests that this may be a useful framework for future studies, as well as indicating the potential for applying a social marketing campaign in its entirety. The concept of promotion in particular was not explored in depth in this study, and thus would need further research.

In addition, this study attempted to utilize the popular social networking website, Facebook, in the collection and analysis of data. Unfortunately, the youth participants did not choose to participate in the project specific Facebook group created by the researcher, for reasons which have been speculated in chapter three (i.e., Facebook was not popular with this particular group). Future research should explore the use of such social networking sites, especially when they are viewed as popular and familiar amongst the target audience.

Finally, an aspect that this study did not explore was whether engaging in rural versus urban nature experiences would influence the responses of the participants and affect their perceptions of the health benefits obtained. Past research has found that while urban nature (i.e., a city park) is seen to promote many health benefits, participants did distinguish urban from more remote settings, like ‘the country’ (Krenichyn, 2006). Not only were these two types of nature differentiated between, engaging in nature that was more rural, such as by running on the beach, was preferred to time exercising in an urban park (Krenichyn). One may speculate that rural versus more urban nature may be preferred by different populations with varying levels of attachment to the natural

environment. Further research in this area could have implications for policy and programming related to green space in cities.

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APPENDIX A  
LETTER OF INVITATION

**Foot Prints: Engaging Youth to be Physically Active in Nature through Photovoice**

As a student between the ages of 15 and 19 years old and enrolled in [name of program], you are invited to participate in a research study that is being conducted by **Janine Drummond and Joan Wharf Higgins** from the **School of Exercise Science, Physical and Health Education** at the University of Victoria.

The goals of this research are: 1.) to understand what the important personal and environmental health issues are for youth; 2.) to use discussion and photography activities to encourage health education and awareness of these issues; and 3.) to use youths' views and experiences to plan programs and make policies related to the environment and health. Participants will attend an information session to learn about the project and some basic photography skills. After this session participants will make their photography project to discuss with the other project participants. Photos will be posted on a private Facebook discussion forum using pseudonyms. During the in-person discussion group, participants will be asked to explain how your pictures represent their opinion on the topic of spending time in nature while being physically active. The researcher will ask some questions and make sure everyone has a turn to speak.

You are invited to participate in the orientation/information session at for about two hours on **Date TBA**. If you want to attend please tell your teacher, [teacher's name], and he will give you a project consent form which you will need to bring to the orientation. If you are 17 years old or younger, you need to have a parent/guardian sign the form. We will be bringing snacks to the orientation. You may or may not choose to continue to participate in the project after the orientation session. Your choice to participate or not will have no effect on your class grade and any school evaluation.

After we hold the follow-up discussion group (approximately one month after the orientation) you will have the option of participating in a presentation of the photography projects. The details of the presentation (time, type, audience) will be decided by the project participants.

If you (or your parents) have questions, please call Janine at (250) 853.3140 or email at [janined@uvic.ca](mailto:janined@uvic.ca) or call Joan at (250) 721.8377.

Thanks!

## APPENDIX B PHOTOVOICE DISCUSSION GROUP QUESTIONS

At the beginning, we will have everyone introduce themselves with their pseudonyms. The researcher will remind participants of the instructions they were given for the projects, and the prompts they were required to answer through photography. Participants will then be asked to volunteer to explain how their pictures represent each of the prompts by answering these questions:

- How do you and your peers engage with nature through bring physically active?
- How does this make you feel?
- How does this affect your health and the health of the environment?
- What youth oriented strategies best support improving the health of your peers and the planet?

Participants will be asked to further consider their photos using the following questions:

- What were you looking to illustrate when you took the picture?
- What is happening in this situation?
- What do you want people to know about this situation?
- What does this have to do with health or environment?
- What circumstances have created this situation? Why does this happen?
- What can be done about this situation? Who has the power to do something?

Further project discussion questions will include:

- What do you find makes it difficult to engage with the environment through physical activity? What would make is easier? What types of activities would you like to do most?
- What is good about engaging with nature through physical activity? What makes it good?
- Are there other activities you would rather be doing? Why? What makes these activities better than being active out in nature?
- What do your friends think about being active in nature? What do others who are important to you think?
- Have your opinions about this subject changed throughout project participation?
- Do you feel you have learned anything new about yourself or your peers through participating? Why or why not?

APPENDIX C  
PARTICIPANT CONSENT FORM

**School of Exercise Science, Physical  
and Health Education**

***Participant Consent Form***

**Engaging Youth to be Physically Active in Nature**

You are invited to participate in a research study that is being conducted by **Janine Drummond**, from the **School of Exercise Science, Physical and Health Education** at the University of Victoria. You may contact her or her project supervisor if you have further questions at:

Investigators:	
<b>Janine Drummond</b> Tel: 250-853-3140 Email: <a href="mailto:janined@uvic.ca">janined@uvic.ca</a>	<b>Dr. Joan Wharf Higgins</b> Tel: 250-721-8377 E-mail: <a href="mailto:jwharfhi@uvic.ca">jwharfhi@uvic.ca</a>

**Reason for the Study**

The reason for the research study is to better understand youths' knowledge, attitudes, behaviours, and general perspectives on engaging with nature through physical activity. I will ask you to take pictures in response to questions and then we will have a group discussion including all of the research participants. During this discussion, you will select your best photos to share with the group, write captions for these photos, and explain how your pictures answer the question prompts.

**Participant Selection**

You are being asked to participate in this study because you are a youth between 15 and 19 years of age, attending [program name] and you received a letter of invitation from your teacher, [teacher's name].

**What is Involved**

There are several procedures in this study, so choosing to take part may include one or more of the following things: attending the orientation session, completing the Photovoice project, participating in the Facebook discussion forum, participating in the in-person discussion group, and assisting in the project presentation. If you agree to voluntarily participate in this research, you can choose to participate in two ways. You can participate in **ONLY** the Photovoice project and discussion group or you can participate in **BOTH** the Photovoice project/discussion group **AND** a conference presentation. You can sign one or both spaces at the bottom of this document to show which part(s) you would like to do. There are no consequences if you later choose not to participate in one or more part(s) of the study. This is explained under *Voluntary Participation*.

**What's in it for you?**

The only inconvenience caused to you by participating in this study is use of your class time during school hours. If you choose to participate in the project presentation in addition to the Photovoice project, you will likely commit an extra 2 hours of your time, possibly outside of school hours.

There are no known risks for you to participate. You only need to share pictures, information or ideas that you feel comfortable to talk about in front of others. We will be bringing snacks to the orientation session and the Photovoice discussion group.

### **Voluntary Participation**

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. There are no consequences to your class grade if you choose not to participate in the study. Please know that if you decide to withdraw from the group discussion, it will be logistically impossible for us to remove individual participant comments. If you decide to participate in the Photovoice project but later withdraw, you will be asked at that time if the data collected up to that point can be used.

### **Keeping your name and identity safe**

In terms of protecting your identity you will be referred to by a code name/number only and any identifying information you share will be removed or changed (e.g., your friend's names, teacher's name).

If you are participating in the group discussion, you will be assigned a code number to which your comments will be matched. Only the researcher and her supervisor will have access to the consent forms, the full list of participants and the assigned codes. Written notes of the discussion will not include any names or other identifying information. No true names will appear in any written report.

To protect the participants' identities, we require that you do not share your project Facebook account password with anyone who is not participating in the study. Also, you are asked to exclude the photo subjects' names, pseudonyms, or other identifying information when writing captions and other comments on the Facebook group. If identifying information is included, the researcher has the right to delete it from the forum.

With your OK, we would like to audio tape the group discussion. The tapes will be erased after we have listened to them and transcribed them onto paper. If you take part in the group discussion, we won't be able to completely protect your identity because others in the group will hear what you say. We will ask everyone to not repeat what others say outside of the group, but we will advise students that other group members may know who you are and will hear what you say. Even though your name will not be used in any reports or discussions outside the group discussion, Facebook discussion forum, and conference presentation (if you choose to participate) we ask you to please understand that within the scope of the project, you will not remain anonymous.

All the information you share with us will be stored in the research office at the University of Victoria to which only the researcher and her supervisor have access. Paper data will be stored in a locked filing cabinet and computer data will be stored in password protected files on the researcher's PC as well as the computer located in the McKinnon building at UVic. All digital photos that are not selected for use by participants will be deleted from the researcher's personal computer once participants have finished choosing their photos.

### **Sharing of Results**

We plan to share the results of this study through writing a thesis, writing articles in research journals and presentations at conferences, and presenting to a group the project participants choose. The Photovoice project results will also be available to participants through the Facebook discussion forum. Please feel free to contact the researchers to request a copy of the final results.



APPENDIX D  
INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE (AUGUST 2002)

SHORT LAST 7 DAYS SELF-ADMINISTERED FORMAT FOR USE WITH YOUNG  
AND MIDDLE-AGED ADULTS (15-69 years)

The International Physical Activity Questionnaires (IPAQ) comprises a set of 4 questionnaires. Long (5 activity domains asked independently) and short (4 generic items) versions for use by either telephone or self-administered methods are available. The purpose of the questionnaires is to provide common instruments that can be used to obtain internationally comparable data on health-related physical activity.

***Background on IPAQ***

The development of an international measure for physical activity commenced in Geneva in 1998 and was followed by extensive reliability and validity testing undertaken across 12 countries (14 sites) during 2000. The final results suggest that these measures have acceptable measurement properties for use in many settings and in different languages, and are suitable for national population-based prevalence studies of participation in physical activity.

*Using IPAQ*

Use of the IPAQ instruments for monitoring and research purposes is encouraged. It is recommended that no changes be made to the order or wording of the questions as this will affect the psychometric properties of the instruments.

*Translation from English and Cultural Adaptation*

Translation from English is supported to facilitate worldwide use of IPAQ. Information on the availability of IPAQ in different languages can be obtained at [www.ipaq.ki.se](http://www.ipaq.ki.se). If a new translation is undertaken we highly recommend using the prescribed back translation methods available on the IPAQ website. If possible please consider making your translated version of IPAQ available to others by contributing it to the IPAQ website. Further details on translation and cultural adaptation can be downloaded from the website.

### **FURTHER DEVELOPMENTS OF IPAQ**

International collaboration on IPAQ is on-going and an **International Physical Activity Prevalence Study** is in progress. For further information see the IPAQ website.

#### *More Information*

More detailed information on the IPAQ process and the research methods used in the development of IPAQ instruments is available at [www.ipaq.ki.se](http://www.ipaq.ki.se) and Booth, M.L. (2000). *Assessment of Physical Activity: An International Perspective*. Research Quarterly for Exercise and Sport, 71 (2): s114-20. Other scientific publications and presentations on the use of IPAQ are summarized on the website.

### *INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE*

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

\_\_\_\_\_ **days per week**

No vigorous physical activities    **→ Skip to question 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

\_\_\_\_\_ **hours per day**

\_\_\_\_\_ **minutes per day**

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

\_\_\_\_\_ **days per week**

No moderate physical activities → **Skip to question 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

\_\_\_\_\_ **hours per day**

\_\_\_\_\_ **minutes per day**

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

\_\_\_\_\_ **days per week**

No walking → **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

\_\_\_\_\_ **hours per day**

\_\_\_\_\_ **minutes per day**

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

\_\_\_\_\_ **hours per day**

\_\_\_\_\_ **minutes per day**

Don't know/Not sure

**This is the end of the questionnaire, thank you for participating.**

APPENDIX E  
PHOTO RELEASE FORM

**Release to Use Photo, Image for Information Sharing Purposes**

I, (please print name) \_\_\_\_\_, grant permission to Janine Drummond (master's student at the University of Victoria) to use photos of me in her "Footprints" Photovoice thesis study. I understand that the photos or images will not be linked to my name, however I may be recognizable to others that know me.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

APPENDIX F  
PHOTOVOICE ASSIGNMENT INSTRUCTIONS

1. If you haven't already done so, please hand in your consent form! It can be faxed to Janine Drummond at 250-472-4242
2. Create a Facebook account using your pseudonym (made-up name).
  - a.) Go to [www.facebook.com](http://www.facebook.com)
  - b.) Under sign up, enter your pseudonym as your name and enter your email address.
  - c.) If you already have a Facebook account, you will need to use a different email address than the one on your existing profile. You can create an email account specifically for this project by going to [www.hotmail.com](http://www.hotmail.com). On the log-in page, click the sign up button and follow the instructions to create an account.
3. Under the Facebook friend finder, search for Janine Robyn D and add me as a friend. Once you can see my profile, request to join the group "Footprints Photovoice Project Group".
4. You can access the participant consent form, study letter of invitation, photo release form (to be signed by people who appear in your project pictures), a summary of the orientation session comments and other project resources under the discussion section of the group. You can also contact Janine, the researcher, if you have any questions about your project or the study in general.
5. Take pictures! (places, people, objects, symbols, etc.) Take at least 10 so you have some to choose from. You can take pictures at any time, including during class outings. When you are taking pictures, think about the ideas that came up during the group discussion and also the following questions:
  - a.) How do you and your peers engage with nature through physical activity?
  - b.) How does this affect your health and the health of the environment?
  - c.) What youth oriented strategies best support improving the health of your peers and the planet?
6. Once you think you have taken enough pictures, select 3-6 of the pictures that you think are the best for this project. Upload these pictures on to a computer and email them to me ([janined@uvic.ca](mailto:janined@uvic.ca)) and/or post them in the Footprints Photovoice Project Facebook group. We will look at and discuss these pictures at our next group discussion (Date TBA), so please be prepared to talk about your photos.

**\*\*Reminder:**

If you are taking a picture of someone and they can be recognized, please make sure to have them sign a photo release form so that we can use this picture in the Photovoice project.

APPENDIX G  
NEWSPAPER ARTICLE ABOUT PHOTOVOICE PROJECT

**Students Provide Lessons on Image**

*University student enlists program participants in thesis study*

**[Author and Newspaper have been deleted to protect confidentiality]**

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[Program name] outdoor adventure program students have a better picture of the correlation between outdoor activity and health.

Janine Drummond, a University of Victoria student working on a master's thesis, has made use of activity by [program name] students to provide documentation as part of her university studies.

In a presentation to the School District [number] Board of Education, Drummond said the students took part in a Photovoice project on the topic of engaging with the environment through physical activity and its effect on health.

“Photovoice is a project where photographs are taken to express the photographer’s voice,” Drummond said. “Perspectives are shown through photography. The goal is to give voice to people who may not typically have it.



**NATURE ALL AROUND:** [Program name] students contributed to a University of Victoria master's thesis by way of photography as they engaged with the environment through physical activity.

“As someone who is familiar with the literature on environment and physical activity and health, I’m really impressed to see a group of students who expressed so wholeheartedly

an interest in environmental and outdoor education and the experiential aspect of that. They have really taken it on and have seen a lot of positive effect.”

Drummond then projected a series of photographs that had inspired the students to examine their thoughts and attitudes toward the outdoors and their well-being.

[Cougar], one of the [program] participants, said the feature that really struck him about the project was the hands-on aspect. “I chose to show that through the different pictures that we took,” he said, presenting a photograph from a kayak trip.

“We were out for three days and it taught us so much,” [Cougar] said. “I’m a person who learns a lot better when I have something to do with my hands. It encourages me to see how much I actually retain when I can do something like that.

“The things we did on the trip, I am going to remember those things forever, simply because I was able to learn through more than just a book. When we are interested we become involved.”

[Grizzly] said [program name] students have been going on trips and as they’ve travelled, they have seen the impacts of humans everywhere. “There is garbage in places you wouldn’t think it could ever get,” he said. “We are working on teaching the next generation not to leave such an impact.”

[Snow Leopard] said he was at the meeting to talk about environmental issues awareness. “Sure, you can say you are going to clean up garbage, but if you actually do it, it’s a greater impact for the community,” he said. “This program and the project have opened my eyes.”

[Snow Leopard] said the project helped him focus on the issues that come with the environment. “We are doing a grade seven camp,” he said. “We are teaching them skills like how to start a fire and how to survive in the woods. I really just hope they go home and teach someone else about the environment.”

Trustee [Name] said the school board has talked a lot about student engagement. “It’s interesting to hear you talk about how engaged you are when you are involved in these kind of activities,” she said.

[Mr. Smith], who coordinates the sustainability and eco-adventure programs in the school district, said from an educational perspective, the reason why he okayed Drummond’s project is because he thought it had value. “There was empowerment for the students taking cameras and for them to go out there and shape their world and show it through their lenses,” he said.